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Strategic Analysis of the 2014 Wounded Warrior Project Annual Alumni Survey

A Way Forward

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Prepared for the Wounded Warrior Project

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Preface

Wounded Warrior Project® (WWP) offers support and raises public awareness of service members who incurred physical or mental injury, illness, or wound coincident to their military service on or after September 11, 2001, as well as their families and caregivers. Each year, WWP conducts an annual assessment of its members (Alumni), to understand how well its programs and services are supporting the mental, physical, and financial well-being of Alumni. WWP asked the RAND Corporation to supplement initial analysis of the 2014 WWP Annual Alumni Survey to assist WWP leadership in better understanding Alumnus mental health, physical health, and economic empowerment.

WWP sponsored this project, and the report is largely intended for the WWP board of directors and WWP staff. The written report does not assume statistical expertise. We refer readers wanting more detail on the analyses presented here to the appendixes.

The work presented in this report builds on research previously presented in the following RAND publications: *Health and Economic Outcomes in the Alumni of the Wounded Warrior Project* (Krull and Haugseth, 2012), *Health and Economic Outcomes in the Alumni of the Wounded Warrior Project: 2010–2012* (Krull and Oguz, 2014), and *Health and Economic Outcomes Among the Alumni of the Wounded Warrior Project: 2013* (Cerully et al., 2014).

This research was conducted within the Forces and Resources Policy Center of the RAND National Security Research Division (NSRD). NSRD conducts research and analysis on defense and national security topics for the U.S. and allied defense, foreign policy, homeland security, and intelligence communities and foundations and other nongovernmental organizations that support defense and national security analysis.

For more information on the Forces and Resources Policy Center, see www.rand.org/nsrd/ndri/centers/frp or contact the director (contact information is provided on the web page).

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Summary

Wounded Warrior Project (WWP) offers support for and raises public awareness of service members and veterans who incurred physical or mental health injuries associated with their service on or after September 11, 2001, as well as their family members and caregivers. Since 2003, the organization has striven to support and engage these service members, their families, and caregivers through programs focused on four main areas: (1) engagement, (2) mind, (3) body, and (4) economic empowerment.

Each year, WWP conducts an assessment—the WWP Annual Alumni Survey—of its members (known as Alumni), to understand how well its programs and services are helping achieve their vision of “fostering the most successful, well-adjusted generation of wounded service members in our nation’s history” (WWP, undated [c]). The survey administrator, Westat, made general survey results available to WWP in an initial report. After Westat presented the initial results to WWP, WWP asked RAND to offer an additional interpretation of survey results to supplement Westat’s interpretation. This report documents our supplemental analysis of 2014 survey data.

How to Use This Analysis, and Changes in Our Assessment Goals for Wounded Warrior Project

The results presented in this report are intended to help WWP understand the needs of its current Alumni. Specifically, we present the physical, mental, and economic status and self-perceptions of WWP Alumni to provide WWP leaders with an opportunity to assess and meet the needs of the current Alumnus population.

This year’s final report differs from our 2013 effort in three significant ways. First, we provide short assessments of WWP outcomes in relation to WWP programs targeting Alumnus health, education, and employment. The assessments are limited, however, because of the nature of the survey data; because the data are correlational, we cannot draw strong conclusions about whether program participation actually caused changes in program outcomes. Second, this report offers an expanded examination of Alumni’s mental health service use. Third, this report offers recommendations based on the analysis of the 2014 Annual Alumni Survey.

Wounded Warrior Project 2014 Annual Alumni Survey, Survey Respondents, and Analytic Method

We based the analysis on data from the 2014 WWP Annual Alumni Survey. The survey included questions about Alumnus characteristics, such as age, gender, race and ethnicity, branch of service, military pay grade, and disability ratings as discerned by the U.S. Department of Veterans Affairs (VA). The survey also included questions regarding Alumnus mental health, physical health, educational, and economic status.

In 2014, 21,120 WWP Alumni completed the survey. Men made up 87 percent¹ of 2014 survey respondents. Most respondents were white (71 percent), between the ages of 26 and 35 (48 percent), and married (67 percent). About 41 percent had completed associate's degrees or higher; 48 percent were employed full time, with an additional 7 percent employed part time. Most respondents (62 percent) reported having health insurance through VA, with an additional 46 percent reporting having some other form of government health care. Most respondents had served in the Army (67 percent) and had pay grades between E-5 and E-9 during their time in service (68 percent). However, most (76 percent) were out of the military at the time of the survey. Because WWP serves service members and veterans who experienced health conditions as a result of their service, it is not surprising that most respondents (69 percent) had VA disability ratings of 50 percent or higher. Alumni reported a variety of service-related health conditions with some of the most prevalent being posttraumatic stress disorder (PTSD) (77 percent); sleep problems (77 percent); back, neck, or shoulder problems (73 percent); depression (69 percent); anxiety (65 percent); tinnitus (56 percent); knee injuries or problems (52 percent); and migraines/other severe headaches (50 percent).

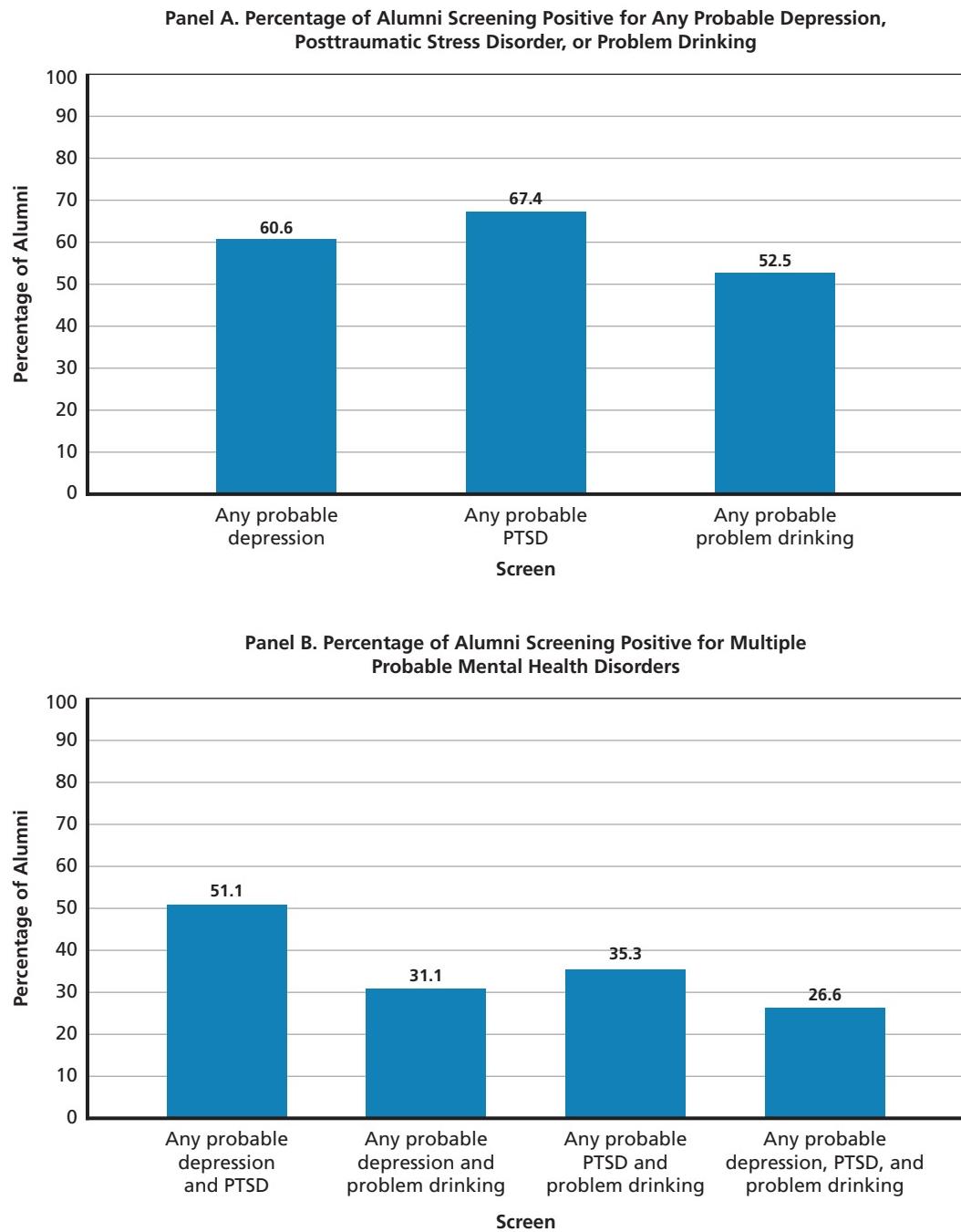
We assembled the data to assess underlying variables of interest and employed regression to estimate variables' quantitative effect on the physical and mental health and educational and economic outcomes of survey respondents. We weighted results of the survey sample to represent the entire population of WWP Alumni, not just survey respondents. We drew outcomes associated with WWP program participation from the same survey data. These data are limited in that they do not specify how respondents were involved with a program at the time in which they took the survey nor show whether program involvement caused changes in outcomes or are merely correlated with them.

Depression, Posttraumatic Stress Disorder, and Problem Drinking Challenge Wounded Warrior Project Alumni's Mental Health

Panel A of Figure S.1 shows that more than half of all WWP Alumni screened positive for each of the following mental health or substance use disorders—any probable depression, PTSD, or problem drinking. In addition, many WWP Alumni screened positive for more than one probable mental health disorder (see panel B of Figure S.1).

¹ We did not weight the percentages in this paragraph. We weighted all remaining percentages in this summary.

Figure S.1
Prevalence of Probable Mental Health Disorders Among 2014 Alumni



SOURCE: WWP, 2014.

RAND RR963-S.1

Accessing Mental Health Care Is a Challenge for Many

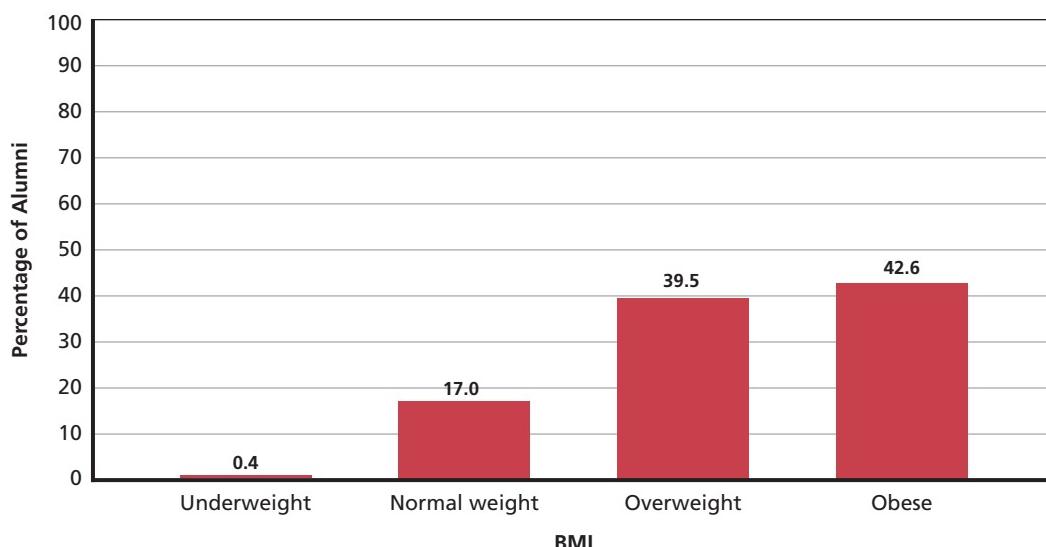
More than half of the Alumni screening positive for any probable depression, any probable PTSD, or any probable problem drinking said that they had visited a professional to assist with mental health challenges; 70 percent of those with any probable depression reported seeing a professional in the prior three months, as did 67 percent of those with any probable PTSD and 52 percent of those with any probable problem drinking. Alumni who screened positive for any probable problem drinking are less likely to have seen a professional for potential mental health problems than Alumni who screened positive for any probable depression or any probable PTSD.

That a large proportion of those needing care received it is a positive finding. However, the 2014 survey results suggest also that many of those in need of care had difficulty or delay getting it or simply did not get it; 47 percent of Alumni who screened positive for any probable depression reported difficulty or delays getting or simply not getting needed mental health care, as did 45 percent of those screening positive for any probable PTSD and 38 percent of those screening positive for any probable problem drinking. The most-common barriers to care reported by Alumni include wanting to avoid talking about painful or traumatic memories, discomfort with existing U.S. Department of Defense (DoD) or VA resources, logistic challenges related to scheduling or treatment consistency, and concern about the effects that obtaining care could have on career plans.

Obesity Is a Health Challenge for Wounded Warrior Project Alumni

Results of the 2014 WWP survey suggest that 80 percent of WWP Alumni have above what is considered a normal body mass index (BMI). Figure S.2 presents the BMI of Alumni; a BMI

Figure S.2
Body Mass Indexes of Wounded Warrior Project Alumni



SOURCE: WWP, 2014.

RAND RR963-S.2

below 18.5 is underweight, 18.5 to 24.9 is a normal weight, 25.0 to 29.9 is considered overweight, and 30 or greater is obese (CDC, 2012).

The prevalence of obesity in the general U.S. population (41.3 percent) is similar to that among WWP Alumni (42.6 percent). However, the rate of overweight among WWP Alumni (39.5 percent) is higher than the rate in the general population (27.2 percent). Alumni with higher BMIs are more likely to report being in fair or poor health, being more limited because of their health, and exercising less than those with lower BMIs.

Analyses of exercise frequency and limitations in performing vigorous activity shed light on which Alumni are most challenged in performing physical activity. The following sub-groups of Alumni exercised less: Alumni who screened positive for any probable depression (0.8 days fewer per week than Alumni who did not screen positive) or who were over the age of 45 (about 0.4 days fewer per week than Alumni between the ages of 26 and 30). Active-duty Alumni reported exercising 0.8 days more and activated National Guard and Reserve 0.5 days more than Alumni who are out of the military. Older Alumni (relative to Alumni ages 26 to 30), severely disabled Alumni (relative to Alumni with VA disability ratings of 10 to 20 percent), Alumni reporting service-related spinal-cord injuries (relative to those without), and Alumni who screened positive for any probable depression (relative to those who did not screen positive) reported the most limitations to vigorous activity. Many Alumni face significant challenges related to performing physical exercise. Physicians' restrictions, fear of reinjury, and discomfort with social situations pose significant limitations for many.

Mental Health and Physical Health of Wounded Warrior Project Alumni Are Related

The 2014 survey data demonstrate the interdependency of WWP Alumni's mental and physical health. Those who screened positive for any probable depression show greater reports of fair or poor health, greater limitations because of health, reduced exercise frequency, and being limited a lot in performing vigorous activity than those who did not screen positive for any probable depression. Similarly, Alumni who screened positive for any probable PTSD are more likely to report being in fair or poor health, greater limitations because of physical health, and being limited a lot in performing vigorous activity than Alumni who did not screen positive for any probable PTSD. Alumni who had screened positive for any probable depression or any probable PTSD are 3.3 and 1.4 times more likely, respectively, to report fair or poor health than Alumni who did not screen positive for any probable PTSD or any probable depression.

Many Wounded Warrior Project Alumni Are Unemployed and Do Not Access Veteran Employment and Education Benefits

In 2014, 51 percent of Alumni were employed full time and 7 percent were employed part time. Unemployed Alumni looking for work represented 8 percent of the sample, while 34 percent were not looking for work or were unable to work if a job were offered. WWP Alumni cited a variety of challenges in securing or changing work. Mental health challenges were the most commonly cited (30 percent), followed by a lack of education (21 percent), physical

health challenges (20 percent), and difficulty finding jobs with sufficient pay (18 percent). Also among those unable to work were Alumni actively pursuing educational goals (19 percent).

As in the 2013 sample, few WWP Alumni take advantage of federal veteran employment and education programs. In brief, of Alumni enrolled in school, less than one-third reported that they were using the VA Vocational Rehabilitation and Employment (VR&E) program, and 57 percent reported using the Post-9/11 GI Bill (Post-9/11 Veterans Educational Assistance Act of 2008; Title V of Pub. L. 110-252) to further their education. A closer examination of Alumni using VR&E show that those with disability ratings of 30 percent or greater are more than 2.1 times more likely to use these benefits than Alumni with lower ratings of 10 to 20 percent (e.g., Alumni with ratings of 30 to 40 percent are 2.2 times more likely and Alumni with ratings of 50 to 60 percent are 2.9 times more likely). Alumni of several minority racial and ethnic groups, including black and Hispanic or Latino, are 1.2 to 1.5 times more likely than white Alumni to use VR&E benefits; Alumni who reported having traumatic brain injury are 1.2 to 1.5 times more likely than those without such injury to use the benefits. Alumni over the age of 40 are less likely than Alumni between the ages of 26 and 30 to use the benefits. Alumni who reported service-related health conditions of severe burns or migraine or other severe headache or who screened positive for probable problem drinking are all less likely to use VR&E benefits than Alumni without these health conditions.

Alumni of several racial or ethnic groups are more likely to use Post-9/11 GI Bill benefits than white Alumni: black (1.4 times), Hispanic or Latino (1.2 times), Asian (1.4 times), and Alumni who selected multiple races or ethnicities (1.3 times). Disability rating was not strongly related to benefit use, though the most-severely disabled Alumni, with ratings of 90 to 100 percent, are less likely to use the benefit than those with lower ratings of 10 to 20 percent.

Survey Data Suggest That Wounded Warrior Project Programs Attract Alumnus Participants with Greater Health Needs

WWP offers many programs that aim to promote the mental and physical well-being of its Alumni, including adaptive sporting events, helplines, and education and employment training. Caution should be used in interpreting this initial examination of WWP program participation and outcomes because the data are cross-sectional; changes in outcomes might not necessarily be due to program participation. Initial exploration suggests that some programs draw those Alumni who reported fair or poor overall health. Some programs draw Alumni with particular conditions. For example, participants in three programs (i.e., Restore Warriors™, Project Odyssey® or Combat Stress Recovery Program, and WWP Talk) reported more PTSD symptoms than Alumni who did not participate in the programs. This information could indicate that at least some of the programs are enrolling Alumni with the greatest physical and mental health needs.

WWP offers a variety of programs that promote positive education and employment outcomes for Alumni. Limited data suggest that just over 12 percent cited their participation in these programs as enabling them to secure full-time employment.

Recommendations

Findings in this report suggest a range of recommendations for WWP leadership to consider as they continue to move forward with meeting WWP strategic goals and assisting military service members, veterans, and their families and caregivers:

1. **Review existing capabilities and consider introducing new capabilities for identifying and referring or intervening with Alumni experiencing mental health symptoms.** WWP already provides various programs, such as the Combat Stress Recovery Program, and individual support to Alumni and their families, as well as assistance on a range of behavioral health challenges, such as stress, anger, relationship problems, self-esteem issues, self-care challenges, loss, depression, alcohol abuse, and drug abuse. However, the 2014 Annual Alumni Survey data indicate that any probable depression, any probable PTSD, and any probable problem drinking are prevalent among WWP Alumni and warrant continued attention. Leadership might want to consider how to complement existing efforts or introduce new efforts to continue to assist Alumni experiencing mental health symptoms through appropriate referral and early intervention.
2. **Explore ways to help WWP Alumni overcome common barriers to obtaining mental health care.** The analysis suggests that a large percentage of Alumni who screened positive for probable mental health disorders are delaying, not getting, or having difficulty getting needed mental health care. WWP might consider taking inventory of its program and service offerings to determine how these barriers to care are being addressed, and bolster such offerings where possible. Where these barriers are not being addressed, WWP might wish to make efforts (evidence-based, where possible) to help Alumni overcome barriers. For example, Alumni with mental health disorders might benefit from illness management and recovery, an evidence-based practice that could allow them to engage more fully in their own treatment and possibly overcome the barriers of having inconsistent care or lapses in care and feeling uncomfortable with existing DoD and VA resources.
3. **Pursue a greater understanding of health needs and service preferences of WWP Alumni who might have alcohol-use problems.** The 2014 survey suggests that 53 percent of WWP Alumni screened positive for any probable problem drinking. However, these Alumni are less likely to receive care than those who screened positive for other mental health challenges, such as any probable depression or any probable PTSD. WWP might wish to consider focusing on Alumni with potential alcohol-use problems to better understand their characteristics, needs, and challenges.
4. **Continue emphasizing weight maintenance and loss.** Through the Physical Health and Wellness program, WWP addresses issues of fitness, nutrition, and wellness by enabling Alumni to participate in activities, such as adaptive sports, yoga, scuba diving, cycling, and culinary education. Because of the high rates of overweight and obesity among WWP Alumni and accompanying negative health outcomes (e.g., more reports of fair or poor health), we recommend that WWP continue emphasizing weight maintenance or loss and consider where efforts could be introduced to complement existing programs. For example, the VA system could provide examples of weight-maintenance or weight-loss interventions that have been successful among veteran populations that could be adapted for WWP Alumni or to whom WWP staff can refer Alumni.

5. **Increase efforts to address education and employment needs of WWP Alumni who have VA disability ratings of 50 percent or greater.** WWP aims to increase the economic well-being of all of its Alumni and provides opportunities to Alumni through various programs, such as Benefits Service, Education Services, Transition Training Academy, and Warriors to Work®. Data from the 2014 Annual Alumni Survey indicate that Alumni with VA disability ratings of 50 percent or greater might face extra challenges to employment that those with lower VA ratings do not experience. WWP might wish to augment existing programs or consider introduction of new efforts to enable this subpopulation of Alumni to overcome barriers to civilian employment.
6. **Explore why WWP Alumni do not participate in the labor force.** Many Alumni might be out of the labor force due to the nature or severity of their service-related health conditions, but others might not seek employment for other reasons. WWP might wish to explore why WWP Alumni do not participate in the labor force, focusing in particular on those who initially sought employment and later left the labor force, to determine whether specific barriers exist for those who wish they were employed.
7. **Commission an objective, external evaluation of WWP programs to determine their effects on outcomes of interest.** In addition to the Annual Alumni Survey, WWP regularly monitors progress toward annual goals and program objectives and tracks key performance indicators. However, WWP could benefit from commissioning an objective, external evaluation from a firm with evaluation expertise to complement internal measurement efforts. Such an evaluation could help provide a more-comprehensive understanding of how program participation results in desired changes in outcomes.

Acknowledgments

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Abbreviations

BMI	body mass index
CDC	Centers for Disease Control and Prevention
CHAMPUS	Civilian Health and Medical Program of the Uniformed Services
CSRP	Combat Stress Recovery Program
DoD	U.S. Department of Defense
NILF	not in the labor force
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OND	Operation New Dawn
PC-PTSD	primary care posttraumatic stress disorder screen
PHQ-8	eight-item Patient Health Questionnaire
PTSD	posttraumatic stress disorder
TBI	traumatic brain injury
VA	U.S. Department of Veterans Affairs
VR&E	Vocational Rehabilitation and Employment
WWP	Wounded Warrior Project

Introduction

More than 2.7 million service members have served in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and Operation New Dawn (OND) (Watson Institute for International and Public Affairs, undated). Although U.S. Department of Defense (DoD) statistics list 52,010 U.S. members as injured in action, they fail to account for the large number of injuries not diagnosed until service members return home (Fischer, 2014). Of 1.8 million separated veterans, 60 percent have obtained health care from the U.S. Department of Veterans Affairs (VA) system (VA, 2014a). This includes care for both physical and mental health conditions, with patients often receiving multiple diagnoses. The most frequent diagnosis in separated OEF, OIF, and OND veterans receiving care at VA is musculoskeletal-system diseases, mainly joint and back problems (VA, 2014a). Second to musculoskeletal diseases are mental health diagnoses (VA, 2014a). For example, between 7 percent and 20 percent of troops deployed during OEF and OIF met criteria for posttraumatic stress disorder (PTSD) (Hoge, Castro, et al., 2004; Ramchand, Schell, et al., 2010; Seal et al., 2007; Smith et al., 2008; Tanielian and Jaycox, 2008; Vasterling et al., 2010), and VA reports more than 300,000 PTSD diagnoses since 2002 (VA, 2014a). Many service members have also experienced traumatic brain injury (TBI), sometimes referred to as the “signature injury” of the recent Iraq and Afghanistan wars because of its prevalence. DoD reports that more than 320,000 service members were medically diagnosed with TBI between 2000 and 2014 (Defense and Veterans Brain Injury Center, 2015). Studies have estimated the prevalence of TBI in OEF, OIF, and OND veterans to be between 12 and 23 percent, with most cases being mild in severity (Hoge, McGurk, et al., 2008; O’Neil et al., 2013; Ramchand, Karney, et al., 2008).

Service members and veterans who experience service-related injuries and health conditions often face ongoing challenges. For example, many experience ongoing symptoms of mental health or substance use conditions, such as depression, PTSD, or problem drinking (Hoge, Auchterlonie, and Milliken, 2006; Cunningham, Henry, and Lyons, 2007; Cerully et al., 2014; Substance Abuse and Mental Health Services Administration, 2012). They face challenges related to weight and report difficulty in completing daily activities and working (Cerully et al., 2014; Littman et al., 2013; Nelson, 2006). And although many wounded service members and veterans can find employment, many still struggle with unemployment or have left the labor force altogether (Cerully et al., 2014; Frueh et al., 1997; Prudential, 2012; Hall et al., 2014; Loughran, 2014). Understanding the needs of wounded service members and veterans is a necessary first step in addressing them.

Goal of This Project and Changes in Our Assessment

The primary goal of this project was to utilize data from an annual survey of service members and veterans who experienced injuries or other health conditions as a result of their military service to provide insight on the mental, physical, and economic well-being of the wounded service member and veteran population. The survey was administered to current and former service members involved with Wounded Warrior Project (WWP), known as *Alumni*. As in previous RAND analyses of WWP Annual Alumni Survey data (Cerully et al., 2014; Krull and Oguz, 2014), we focus on associations between Alumnus characteristics (e.g., sociodemographic characteristics and type of service-related health condition experienced) and mental health, physical health, and economic outcomes.

The 2014 report differs from RAND's 2013 analyses in three ways, however. First, we provide brief assessments of WWP program outcomes in relation to Alumnus health, education, and employment. Previous RAND assessments offered no attempt at exploring outcomes and WWP program participation. Readers should keep in mind that the program assessments presented here are limited because of the nature of the survey data. Because the survey includes a question asking only whether a respondent participated in a program or not, we cannot know whether the respondent is currently participating or has ceased. Also, for programs allowing for longer-term participation, we cannot know the duration of participation. These factors make it impossible to draw strong conclusions about how program participation affects outcomes of interest. Second, the 2014 report offers an expanded examination of Alumni's receipt of mental health services. Mental health challenges deeply affect the population of service members and veterans who experience health problems as a result of their service, and information about how Alumni access mental health services can help WWP decisionmakers design appropriate programs and work with policymakers. Finally, the 2014 report offers recommendations based on the analysis of the year's WWP Annual Alumni Survey. WWP leadership can consider these as it continues moving forward with WWP strategic goals and assisting WWP Alumni.

It should be noted that this report does not serve as an evaluation of the impact or success of WWP programs. Rather, the survey and this report of its results are both designed to serve as a tool for WWP to understand the challenges that its Alumni face. As such, a major goal is to shed light on the areas in which WWP Alumni face the greatest needs in an effort to provide the WWP Board of Directors and staff with the information they need to make decisions about their efforts and policies.

Wounded Warrior Project

WWP is a national, nonpartisan, charitable organization headquartered in Jacksonville, Florida, whose mission is "to honor and empower Wounded Warriors" (WWP, undated [c]). WWP refers to its members as Alumni; to become a WWP Alumnus, a service member or veteran must have incurred a military service–related injury (i.e., a physical or mental health condition connected to his or her military service) on or after September 11, 2001.

The following three strategic objectives guide much of WWP's work:

- strategic objective 1: Ensure that Alumni are well-adjusted in mind and spirit.
- strategic objective 2: Ensure that Alumni are well-adjusted in body.
- strategic objective 3: Ensure that Alumni are economically empowered.

Method Overview

This study drew on data from the 2014 WWP Annual Alumni Survey. In this section, we provide a brief overview of the 2014 Annual Alumni Survey and the types of questions it asked, along with a brief description of the sample characteristics. More-detailed information about the survey and sample are available in Appendix A and in a report drafted by Westat, the company that administers the survey (Franklin et al., 2014).

The 2014 Wounded Warrior Project Annual Alumni Survey

This project involved analysis of data from an annual survey of WWP Alumni, a tool that WWP uses to monitor progress in meeting its strategic objectives. The 2014 WWP Annual Alumni Survey was the fourth in a series of annual surveys of WWP Alumni, and it was based on content developed jointly by RAND and Westat for the initial WWP Annual Alumni Survey in 2011. The survey contained questions about Alumnus mental health and well-being, physical health, and economic outcomes, as well as sociodemographic characteristics (see Table 1.1 for the survey content included in this report).

Sample Characteristics

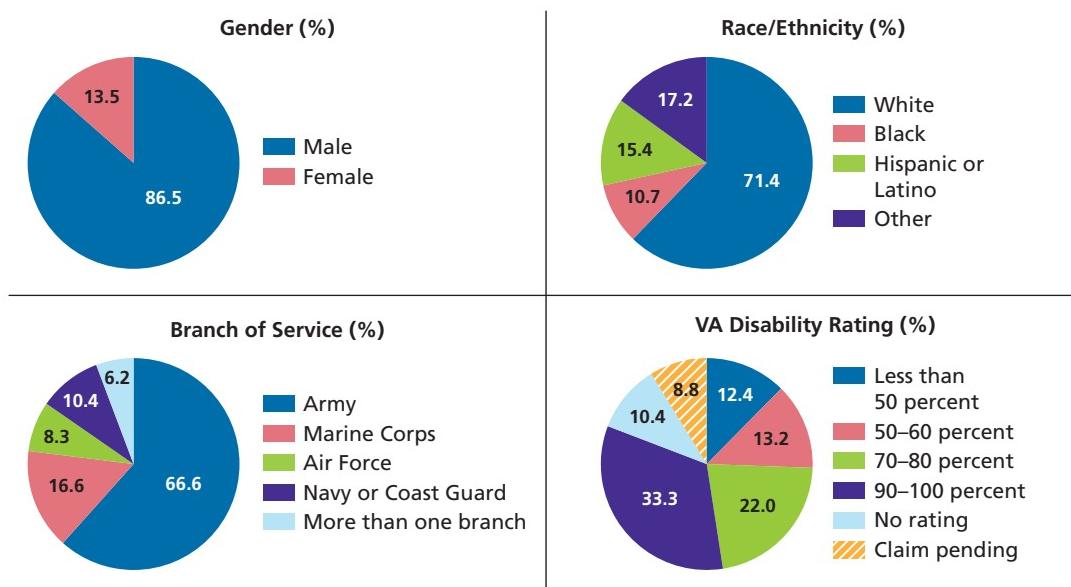
The survey attempted a census of WWP Alumni, in that all WWP Alumni in the WWP database were invited to participate. In 2014, 21,120 WWP Alumni completed the survey (a response rate of 49 percent). In terms of sociodemographic characteristics (see Figure 1.1),

Table 1.1
Wounded Warrior Project Annual Alumni Survey Content Addressed in This Report

Category	Content
Alumnus characteristics	Demographic characteristics (e.g., age, gender, and race) Military service (e.g., branch of service, service component, and highest pay grade reached) Type of service-related injury or health condition VA disability rating
Mental health outcomes	Validated screening measures for any probable depression, PTSD, and problem drinking Receipt of mental health care Difficulty, delay, or not getting needed mental health care
Physical health outcomes	BMI General self-reported health status Frequency of exercise Physical limitations
Economic and educational outcomes	Employment status Use of government work and education benefits

NOTE: BMI = body mass index.

Figure 1.1
2014 Wounded Warrior Project Annual Alumni Survey Sample Characteristics



SOURCE: WWP, 2014.

NOTE: Percentages are unweighted.

RAND RR963-1.1

87 percent of survey respondents were male, and 71 percent were white. Nearly half of the sample were between the ages 26 of 35, and 67 percent were married. In terms of education, about 41 percent had completed associate's degrees or higher. Forty-eight percent of respondents were employed full time, with an additional 7 percent employed part time. Most respondents (62 percent) reported having health insurance through VA, with an additional 46 percent reporting having some other form of government health care (e.g., TRICARE or Civilian Health and Medical Program of the Uniformed Services [CHAMPUS]). Most respondents had served in the Army (67 percent) and had pay grades between E-5 and E-9 during their time in service (68 percent). However, most were out of the military (76 percent) at the time of the survey. Because WWP serves service members and veterans who experienced health conditions as a result of their service, it is not surprising that most respondents (69 percent) had VA disability ratings of 50 percent or higher. Respondents reported having many different types of service-related injuries, with some of the most prevalent being PTSD (77 percent); sleep problem (77 percent); back, neck, or shoulder problem (73 percent); depression (69 percent); anxiety (65 percent); tinnitus (56 percent); knee injury or problem (52 percent); and migraine or other severe headache (50 percent). We did not weight the percentages reported in this paragraph. Appendix A provides a full table of sample characteristics, containing all unweighted percentages, as well as weighted percentages.

Analysis Strategy

To understand how WWP Alumni fare on different mental health, physical health, and economic measures, we conducted regression analyses. Regression analysis techniques allow for

the exploration of relationships among many different variables. In all regression analyses, respondent characteristics (e.g., age, military pay grade, or type of service-related health condition reported) serve as what we call explanatory variables because they can explain variation in outcome measures. For example, if we use respondent's branch of service (i.e., Army, Navy or Coast Guard, Marine Corps, and Air Force) as an explanatory variable when looking at health status, the results can provide information about how branch of service and health status are related in the sample of WWP Alumni. Explanatory variables explored in this study include gender; race and ethnicity; age; marital status; branch of service; service component; rank; VA disability rating; type of service-related health condition incurred; and positive screens for any probable depression, PTSD, or problem drinking. We entered all explanatory variables into the analysis simultaneously. Appendix A includes more details on the analysis strategy and interpretation of regression analyses. Analyzing all 2014 WWP Annual Alumni Survey data was beyond the scope of this project, so, in collaboration with WWP staff, we strategically selected a set of analyses.

Interpreting Results

The reader should keep in mind several important points while reviewing this report. First, reported analyses are from a single survey administration, so we cannot interpret the relationships among variables as being causal in nature. Consider a hypothetical example in which an analysis shows that Air Force respondents reported poorer health status than Army respondents. We cannot conclude that being in a specific branch of service caused poorer health. A more appropriate interpretation is that there is some relationship between branch of service and health status, but the direction is not clear. Possible explanations include that branch of service might influence health status, health status might influence choice of branch of service, or a third factor might influence both.

Second, we often present results in terms of reference groups. That is, in a regression analysis exploring the relationship between an Alumnus characteristic and an outcome, we present the effects of one characteristic relative to a reference group for that characteristic. Using the hypothetical example from the previous paragraph, the Army serves as the reference group for the analysis. We interpret the effect of having served in the Air Force (the Alumnus characteristic of interest) on health status (the outcome) in reference to being in the Army (the reference group for the Alumnus characteristic for which there is a significant result).

The issue of a reference group is especially important when considering the variables for having positive screens for any probable depression, PTSD, or problem drinking because Alumni can screen positive for zero to three of the disorders. If, for example, an analysis includes a significant result for the effect of any probable depression on an outcome, we would interpret that in the following manner: Alumni with any probable depression (i.e., a positive screen for probable depression only or positive screens for probable depression and at least one other disorder) reported different levels of the outcome variable from that of the reference group of Alumni who did not screen positive for any probable depression (i.e., Alumni who did not screen positive for any disorder, as well as Alumni who screened positive for probable PTSD only, probable problem drinking only, or both PTSD and problem drinking).

Finally, unless otherwise specified, we weight the results reported in the remainder of the report. This means that we have adjusted the data so that we can interpret results as being rep-

representative of all WWP Alumni, not just those who responded to the survey. Westat developed the weights used in the analyses, which are described in detail elsewhere (Franklin et al., 2014).

How the Report Is Organized

This report contains the results of the analysis of a subset of 2014 WWP Annual Alumni Survey data. Chapter Two informs strategic objectives 1 and 2 and contains results related to mental and physical health outcomes. Chapter Three informs strategic objective 3 and contains results related to Alumni's economic well-being. Chapter Four presents several recommendations for WWP consideration as it determines how best to address Alumnus needs. Appendix A presents details on the survey methods and analysis strategies. For those who wish to review them, other appendixes contain the details of specific regression analyses presented in the report, including tables of regression coefficients and odds ratios. Appendix B provides details of the analyses in Chapter Two for strategic objectives 1 and 2. Finally, Appendix C has details for the analyses in Chapter Three for strategic objective 3.

Mental and Physical Health of Wounded Warrior Project Alumni

This chapter details the mental and physical health of WWP Alumni and provides insight on to WWP's first two strategic objectives: to ensure that WWP Alumni are well-adjusted in mind and spirit and to ensure that WWP Alumni are well-adjusted in body. The mental health section provides data on the mental health challenges Alumni face, along with their mental health care receipt and reported difficulty in getting care. The physical health section discusses findings related to BMI, self-reported health status, physical limitations, and exercise frequency. Appendix B contains details of the regression analyses reported in this chapter.

Mental Health

More Than Half of Alumni Experience Significant Mental Health Symptoms and Problems

The 2014 WWP Annual Alumni Survey contained measures that allowed respondents to be screened for any probable depression, PTSD, and problematic alcohol consumption (referred to as "any probable problem drinking"). These screening measures assess the degree to which respondents reported having symptoms of mental health conditions and provide some indication of the number of respondents who might be experiencing mental health conditions. Because large-scale surveys preclude the option of having a mental health professional assess each respondent for mental health conditions, screening measures are commonly used to identify the prevalence of disorders by identifying the number of people who screened positive. All three of the included screening measures have been psychometrically tested and validated and are widely used for assessing the prevalence of the relevant mental health disorder. Table 2.1 briefly describes these measures, and Appendix B.1 provides more detail on each measure, including specificity and sensitivity when using our selected thresholds to determine a positive screen.

In this chapter, we opt to focus on the mental health disorders for which a screening instrument was included (i.e., probable depression, PTSD, and problem drinking) because the use of the validated instruments provides an objective measure of the symptoms experienced by Alumni at the time of the survey and maps most closely to the mental health care questions included in the survey, which reference having received care in the prior three months. We also restrict the mental health analyses included in this chapter to the subsample of Alumni who screened positive for at least one probable mental health disorder. As mentioned in the previous chapter, it is here that caution must be used when interpreting the results. For example, an analysis could be conducted on the subsample of Alumni screening positive for at least one mental health disorder and yield a significant result for the association between any probable

Table 2.1
Mental Health Screening Measures Included in the Survey

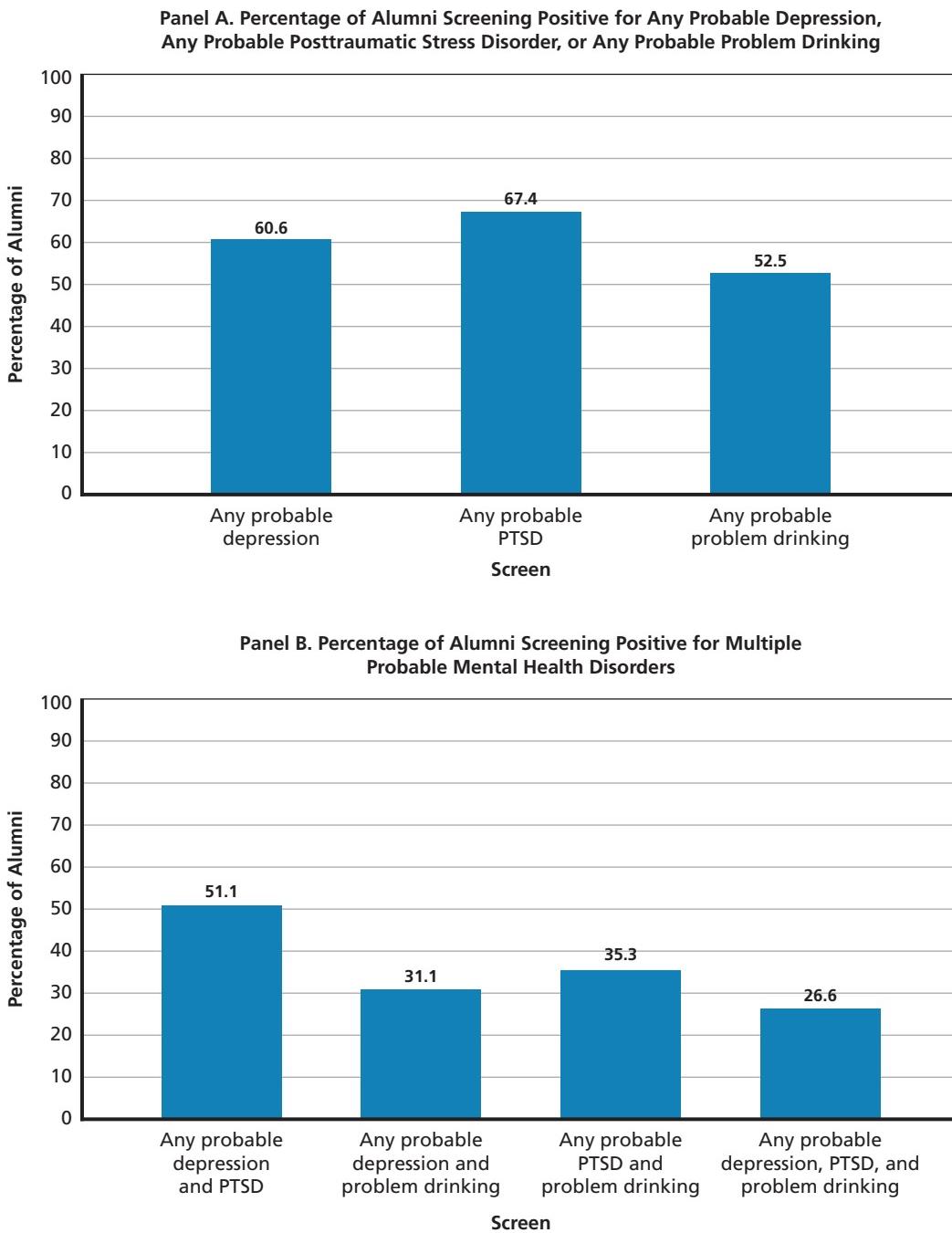
Disorder	Name of Instrument	Description of Instrument and Threshold Score
Depression	PHQ-8 (Kroenke et al., 2009)	The PHQ-8 requires the respondent to endorse the frequency with which he or she experiences each of eight symptoms of depression (e.g., feeling down, depressed, or hopeless or feeling tired or having little energy). We designated any respondent who met a threshold score of 10 as screening positive for any probable depression.
PTSD	PC-PTSD (Prins et al., 2003)	The PC-PTSD requires the respondent to report whether he or she has experienced each of four PTSD symptoms (e.g., nightmares or feeling on guard or watchful). We considered any respondent who met a threshold score of 3 to have screened positive for any probable PTSD.
Problem drinking	Alcohol Use Disorders Identification Test (AUDIT-C) (Bush et al., 1998)	The respondent reports the frequency and amount of drinking, as well as heavy-drinking episodes. We considered any respondent who met the threshold score for his or her gender (a score of 4 for men or 3 for women) to have screened positive for any probable problem drinking.

NOTE: PHQ-8 = eight-item Patient Health Questionnaire. PC-PTSD = primary care PTSD screen.

PTSD and an outcome variable. We would interpret this finding in the following manner: Alumni with any probable PTSD (i.e., a positive screen for probable PTSD only or positive screens for probable PTSD and at least one other disorder) reported different levels of the outcome variable from those reported by the reference group of Alumni who did not screen positive for any probable PTSD (i.e., Alumni who screened positive for probable depression only, who screened positive for probable problem drinking only, or who screened positive for both depression and problem drinking). One limitation to the analysis strategy is that, because no variable in our analyses accounts specifically for positive screens for multiple mental health disorders, we cannot directly compare Alumni with single probable mental health disorders and Alumni experiencing multiple probable mental health disorders. It was beyond the scope of this report to conduct these analyses, but, in the future, we hope to explore this issue more thoroughly. We also note that WWP Alumni could report having experienced several service-related mental health conditions, including depression, PTSD, anxiety, or “other severe mental injury,” as part of the survey item asking about service-related injuries experienced. We include Alumnus reports of these service-related mental health conditions in all analyses presented in the appendixes.

Among WWP Alumni, at least half screened positive for any probable depression, any probable PTSD, or any probable problem drinking (see Figure 2.1, panel A), with roughly one-third to one-half of Alumni screening positive for multiple probable mental health conditions (see Figure 2.1, panel B). The prevalence rates for any probable depression, any probable PTSD, and any probable problem drinking are higher than the prevalence rates reported in other studies of OEF and OIF veterans. For example, rates of depression have been estimated at 14 percent of returning OEF and OIF veterans (Tanielian and Jaycox, 2008). Rates of PTSD have ranged from 7 to 20 percent (Hoge, Castro, et al., 2004; Ramchand, Schell, et al., 2010; Seal et al., 2007; Smith et al., 2008; Tanielian and Jaycox, 2008; Vasterling et al., 2010). Rates of problem drinking among OEF and OIF veterans utilizing VA health care are around 40 percent (Calhoun et al., 2008). Given that experiencing a physical or mental health condition coincident to military service is required to be an Alumnus, we would expect higher

Figure 2.1
Prevalence of Probable Mental Health Disorders Among 2014 Alumni



SOURCE: WWP, 2014.

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rates of probable mental health and substance use disorders among WWP Alumni. However, utilization of different screening measures in various studies estimating the prevalence of possible mental health conditions might contribute to differences in estimates of mental health disorders among WWP Alumni and other military and veteran populations. The 2014 rates of

probable depression, PTSD, and problem drinking are comparable to those reported by WWP Alumni participating in the 2013 survey (Cerully et al., 2014).

More Than Half of Alumni with Probable Mental Health Disorders Received Professional Help for Possible Mental Health Problems

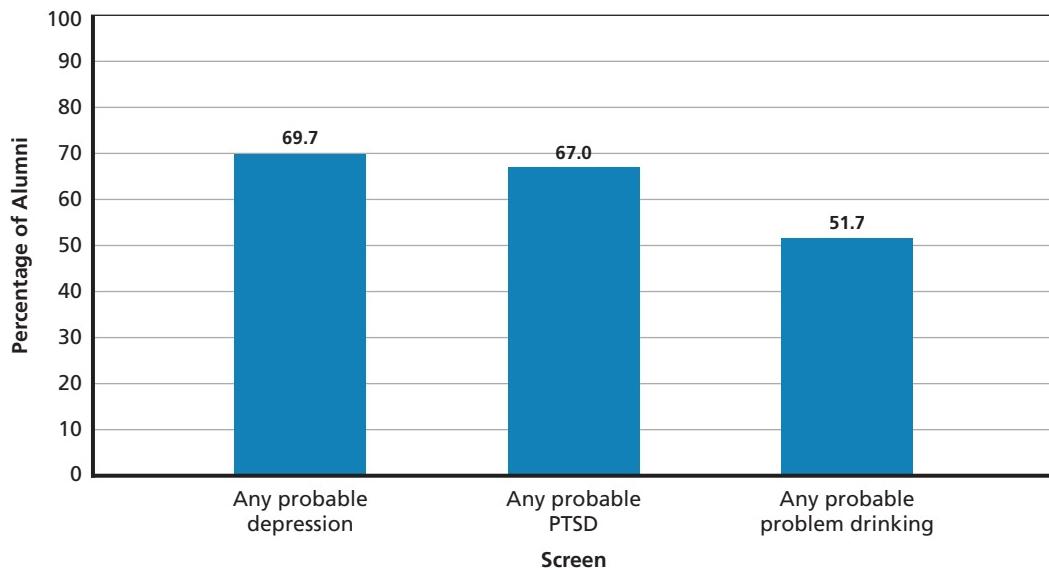
The 2014 WWP Annual Alumni Survey asked respondents a series of questions about whether they had received mental health care in the prior three months and, if so, the types of providers they saw. These questions, as they appeared on the unpublished survey instrument, were as follows (emphasis is ours):

In the past three months,

- Have you **visited any professional**, like a doctor, a psychologist, or a counselor, to get help with issues, such as stress, emotional, alcohol, drug, or family problems?
- Did you **visit a regular medical doctor or primary care physician** for these problems?
- Did you **visit a mental health specialist**, like a psychiatrist, psychologist, social worker, or counselor, for these problems?
- Have you been **prescribed any medication** for a mental health or emotional problem?
- Have you **received counseling**, either individual, family, or group counseling, for a mental health or emotional problem?

Overall, more than half of Alumni who had screened positive for any probable depression, any probable PTSD, or any probable problem drinking said that they had received professional

Figure 2.2
Percentage of Alumni with Probable Mental Health Disorders Who Visited Professionals for Such Issues as Stress, Emotional, Alcohol, Drug, or Family Problems



SOURCE: WWP, 2014.

RAND RR963-2.2

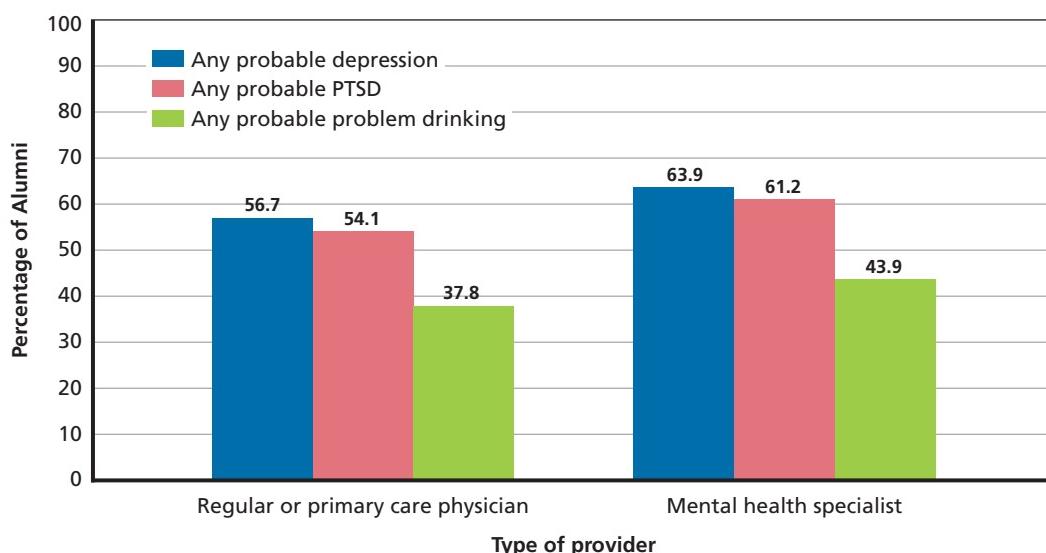
help in the past three months for such issues as “stress, emotional, alcohol, drug, or family problems” (see Figure 2.2).

To focus on Alumni with the greatest need for mental health care at the time of the survey, we conducted a regression analysis of this outcome (i.e., visiting a professional for potential mental health problems in the past three months) that included only Alumni who screened positive for one or more probable disorders: depression, PTSD, or problem drinking (see Appendix B.2). Alumni who screened positive for any probable depression are 1.9 times more likely than those who did not screen positive for any probable depression but positive for any probable PTSD, any problem drinking, or both to report receiving professional help. Similarly, Alumni who screened positive for any probable PTSD are 1.9 times more likely to report receiving professional help than Alumni who did not screen positive for any probable PTSD but positive for any probable depression, any problem drinking, or both. In contrast, Alumni who screened positive for any probable problem drinking are less likely to have received professional help than Alumni who did not screen positive but who screened positive for any probable depression, any probable PTSD, or both. Appendix B.2 describes other Alumnus characteristics associated with a change in likelihood that Alumni who screened positive for at least one probable mental health disorder would receive professional help. Most notably, Alumni who are serving on active duty or who are activated National Guard or Reserve are 2.6 and 2.1 times more likely to receive help than those who are out of the military.

The survey asked any respondent who indicated having visited a professional for potential mental health problems about the type of provider visited (see Figure 2.3). Among Alumni who screened positive for any probable depression, 57 percent reported having visited regular or primary care doctors for potential mental health problems in the prior three months, and 64 percent had visited mental health specialists. Rates are similar among Alumni who screened

Figure 2.3

Types of Providers Visited by Alumni Screening Positive for Any Probable Depression, Any Probable Posttraumatic Stress Disorder, or Any Probable Problem Drinking



SOURCE: WWP, 2014.

RAND RR963-2.3

positive for any probable PTSD, with 54 percent seeing regular or primary care doctors and 61 percent seeing mental health specialists. Among Alumni who screened positive for any probable problem drinking, 38 percent had seen regular or primary care doctors about potential mental health problems, and 44 percent had seen mental health specialists.

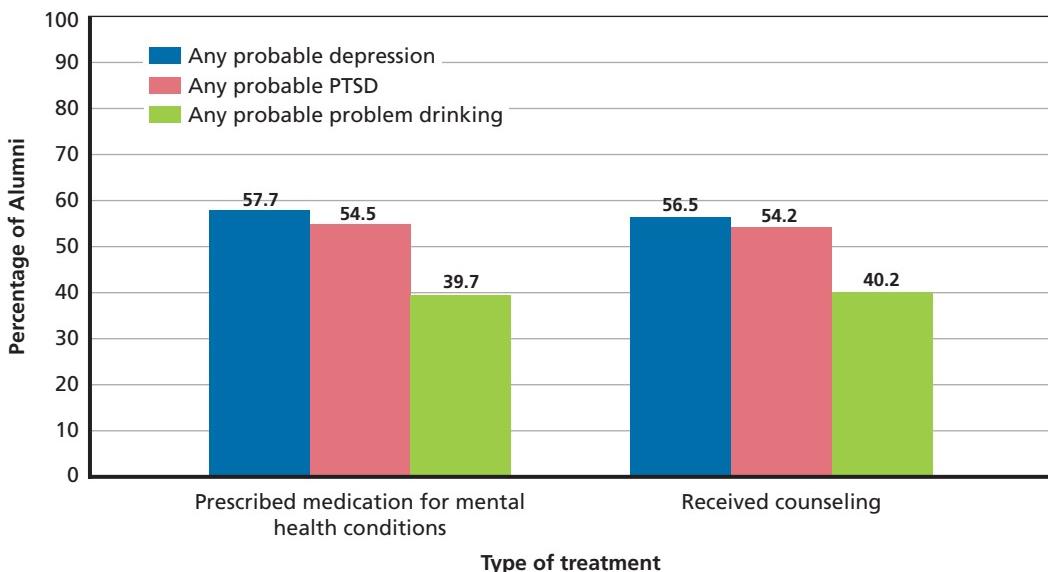
We conducted regression analyses to explore the relationship between Alumnus characteristics and the types of providers visited (see Appendixes B.3 and B.4). We restricted these analyses to Alumni who had screened positive for any probable depression, any probable PTSD, or any probable problem drinking and who are thus the most likely to be in need of mental health care. Alumni who screened positive for any probable depression are 1.3 times more likely to have received care from primary care providers or regular medical doctors than Alumni who did not screen positive but who did screen positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.5 times more likely to have received care from primary care providers or regular medical doctors than Alumni who did not screen positive but who did screen positive for any probable depression, any probable problem drinking, or both. Alumni who screened positive for any probable problem drinking are less likely to obtain care from primary care physicians or regular medical doctors than Alumni who did not screen positive but who screened positive for any probable depression, any probable PTSD, or both.

Alumni who screened positive for any probable depression are 1.6 times more likely to have seen a mental health specialist than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable problem drinking are less likely to have received care from mental health specialists than Alumni who did not screen positive but who did screen positive for any probable depression, any probable PTSD, or both.

Regression analyses provided additional insight on the subgroups of Alumni who had screened positive for at least one probable mental health disorders and who are more and less likely to receive care from different professionals. Appendixes B.3 and B.4 provide the full set of characteristics associated with differential likelihood of receiving care from regular doctors or primary care physicians or from mental health specialists. To highlight one of the larger differences, we note that Alumni who had screened positive for at least one probable mental health disorder and Alumni who were age 56 and up were about twice as likely to receive care for mental health challenges from regular medical doctors or primary care physicians than younger Alumni (ages 26–30). Alumni who had screened positive and reported service-related blindness or severe vision loss are 2.2 times more likely to have seen regular medical doctors or primary care physicians than Alumni who did not experience blindness or vision loss. Among Alumni who screened positive for at least one probable mental health disorder, Alumni serving on active duty or who are activated National Guard and Reserve are 2.7 and 4.0 times more likely, respectively, than Alumni out of the military to receive care from these providers. Alumni who are serving on active duty or who are activated National Guard and Reserve are also 2.0 and 2.2 times more likely, respectively, than Alumni out of the military to receive care from mental health specialists.

We also asked respondents who indicated that they had visited professionals for potential mental health problems and who screened positive for at least one probable mental health disorder about whether they had received either of two types of treatments—medications for mental health conditions or counseling (see Figure 2.4). About 58 percent of Alumni who screened positive for any probable depression had been prescribed medication for mental health

Figure 2.4
Types of Treatment Received



SOURCE: WWP, 2014.

RAND RR963-2.4

conditions, and a similar percentage (57 percent) had received counseling. Fifty-five percent of Alumni who screened positive for any probable PTSD had received medication, and a similar percentage (54 percent) had received counseling. Forty percent of Alumni who screened positive for any probable problem drinking had been prescribed medication, and the same percentage had received counseling.

According to a regression analysis (see Appendix B.5), Alumni who screened positive for any probable depression are 2.0 times more likely to have been prescribed medication than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.6 times more likely to have been prescribed medication for mental health conditions than those who did not but who screened positive for any probable depression, any probable problem drinking, or both.

In a separate analysis (see Appendix B.6), Alumni who screened positive for any probable depression are 1.3 times more likely to receive counseling for mental health problems than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.5 times more likely to receive counseling for mental health problems than Alumni who did not screen positive but who screened positive for any probable depression, any probable problem drinking, or both.

Regression analyses provided additional insight on the subgroups of Alumni who screened positive for at least one probable mental health disorder who are more and less likely to receive these two treatments (see Appendixes B.5 and B.6). We observed one of the largest differences among severely disabled Alumni. Alumni with VA disability ratings of 90 to 100 percent are 2.0 times more likely to have been prescribed medication for mental health problems than Alumni with 10- to 20-percent ratings.

In summary, more than half of Alumni who screened positive for at least one probable mental health disorder received professional help for potential mental health problems. It is a positive sign that approximately two-thirds of those screening positive for either of two mental health disorders—any probable depression or any probable PTSD—are receiving care, though this still leaves a substantial proportion of Alumni experiencing symptoms who are not. Fewer Alumni (52 percent) who screened positive for any probable problem drinking reported receiving care, indicating that a large proportion who could be in need of care are not getting it. Results also indicate that Alumni who screened positive for at least one probable mental health disorder are getting care from both primary care doctors and mental health specialists and receive various treatments, including medication and counseling. The survey does not allow us to learn about the other types of treatments received or types of providers seen, nor does it address issues of the quality of care received by WWP Alumni.

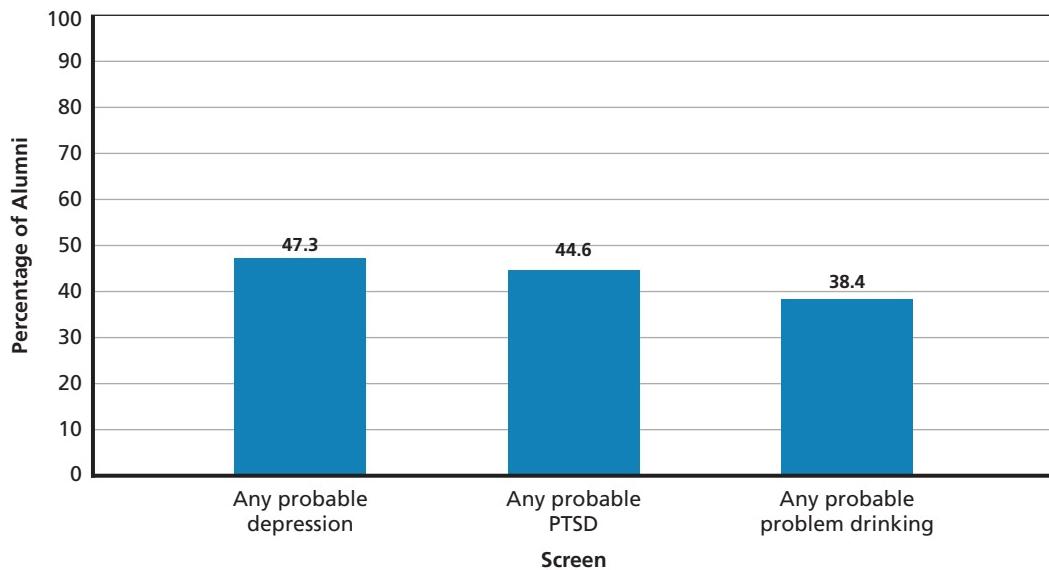
Many Alumni Reported Challenges Accessing Mental Health Care

The prevalence of probable depression, PTSD, and problem drinking among WWP Alumni might signal an accompanying need for mental health care. As noted previously, many Alumni who screened positive for probable mental health conditions reported having received care. However, many Alumni who screened positive for probable mental health disorders also responded “yes” to the following question: “During the past 12 months, were there any times when you had difficulty getting mental health care or you put off getting care or you did not get the mental health care you thought you needed?” (see Figure 2.5).

We conducted a regression analysis to explore the relationship between Alumnus characteristics and reporting having difficulty, delays, or not getting care (see Appendix B.7). As with

Figure 2.5

Proportion of 2014 Alumni with Any Probable Depression, Any Probable Posttraumatic Stress Disorder, or Any Probable Problem Drinking Who Reported Difficulty, Delays, or Not Getting Needed Mental Health Care



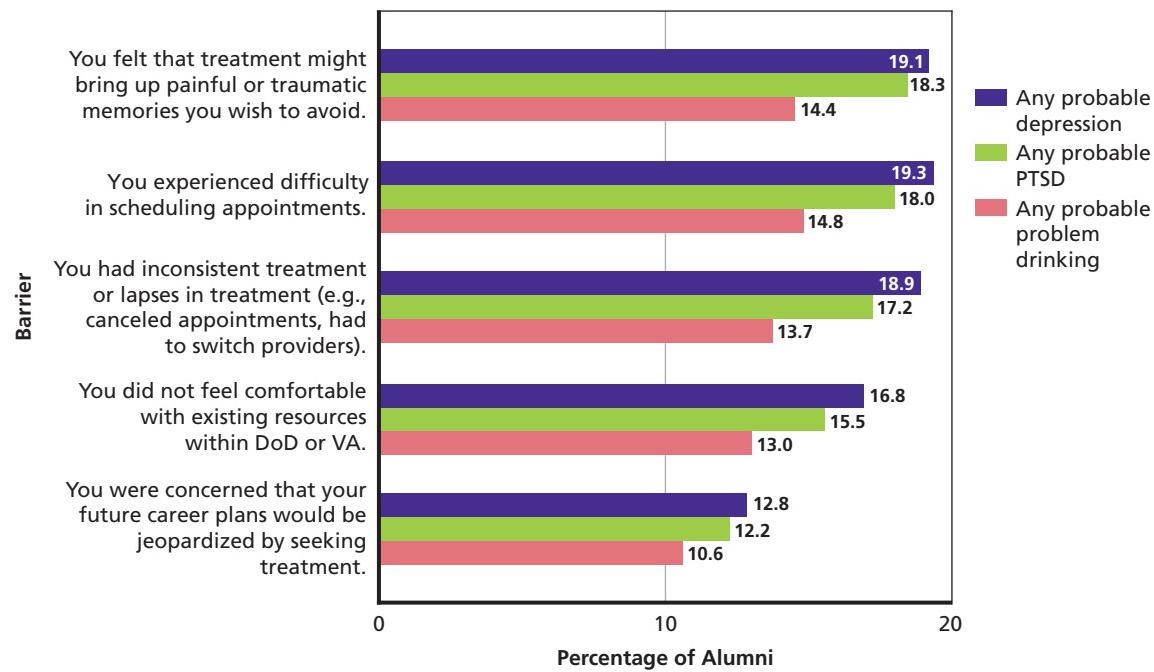
SOURCE: WWP, 2014.

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previous mental health care analyses, we included in the analysis only Alumni who screened positive for at least one probable mental health disorder. Alumni who screened positive for any probable depression are 2.2 times more likely to report difficulty, putting off, or not getting care than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.8 times more likely to report having difficulty, putting off, or not getting mental health care than those who did not screen positive but who screened positive for any probable depression, any probable problem drinking, or both. Alumni who screened positive for any probable problem drinking are 1.3 times more likely than those who did not but who screened positive for any probable depression, any probable problem drinking, or both.

The survey asked respondents who endorsed having difficulty, putting off, or not getting mental health care why they did not get care. Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking all reported the same top five barriers to care (see Figure 2.6). Many of the barriers to getting care reported among this sample have also been documented in other literature. For example, Stecker and colleagues found that, among a sample of 143 OEF and OIF veterans with moderate to severe PTSD symptoms, 22 percent felt that it would be “too hard” to talk to someone about their symptoms (Stecker et al., 2013), indicating concern about discussing experienced trauma. Logistical barriers, such as having trouble getting appointments or having inconsistent treatment, are well-documented (Hoge, McGurk, et al., 2008; Kim et al., 2011; Tanielian and Jaycox, 2008; Vogt et al., 2006). Military service members frequently cite career concerns, including concern about losing the respect of one’s commander, as barriers to care (Hoge, McGurk, et al., 2008;

Figure 2.6
Top Five Barriers to Mental Health Care Among 2014 Alumni with Any Probable Depression, Any Probable Posttraumatic Stress Disorder, or Any Probable Problem Drinking



SOURCE: WWP, 2014.

RAND RR963-2.6

Kim et al., 2011; Tanielian and Jaycox, 2008; Pietrzak et al., 2009). It is difficult to determine how best to interpret the barrier of not feeling comfortable with existing resources within DoD or VA. This might represent some type of practical barrier to care, or the feelings of discomfort could represent stigma-related concerns.

Although the survey focused on a subset of barriers to care, the list of possible barriers is not comprehensive. Because self-reports of barriers to care do not always predict obtaining treatment (Hoerster et al., 2012), it is likely important to obtain a more comprehensive understanding of factors influencing the receipt of care (including facilitators, such as readiness for change) (Jakupcak et al., 2013). Such an approach could better guide decisions about what interventions and services might be offered to WWP Alumni to promote better receipt of mental health care.

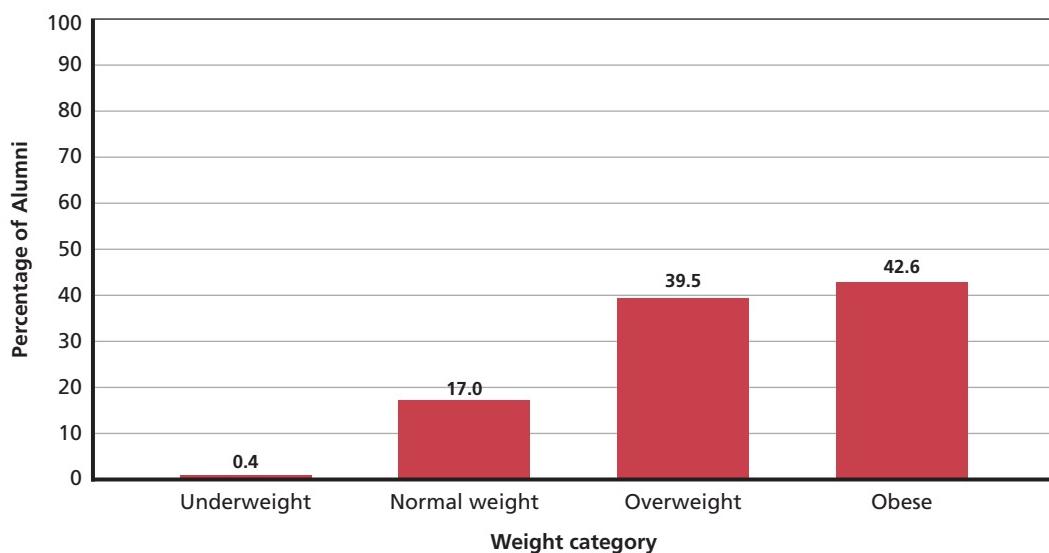
Physical Health

More Than 80 Percent of Alumni Are Overweight or Obese

Obesity affects the United States nationwide but is a particularly salient issue among WWP Alumni who might face greater barriers to engaging in the physical activity needed to maintain a normal weight. To determine whether a person is at a normal weight, measures of height and weight are used to calculate BMI. The Centers for Disease Control and Prevention (CDC) considers a BMI below 18.5 underweight, 18.5 to 24.9 a normal weight, 25.0 to 29.9 overweight, and 30 or greater obese (CDC, 2012). Someone with a BMI higher than what is considered a normal weight is at greater risk of developing heart disease, type 2 diabetes, high blood pressure, and other serious health problems (National Heart, Lung, and Blood Institute, undated).

The majority of WWP Alumni are above what is considered a normal body weight. As shown in Figure 2.7, very few Alumni are underweight, and only 17.0 percent of Alumni fall

Figure 2.7
Body Mass Index of Wounded Warrior Project Alumni



SOURCE: WWP, 2014.

RAND RR963-2.7

into the normal weight category. Compared with 27.2 percent of the general U.S. population, 39.5 percent of Alumni are considered overweight (Ogden et al., 2014). The rate of obesity among WWP Alumni (42.6 percent) is similar to the rate among the general U.S. population (41.3 percent) (Ogden et al., 2014). The rates of overweight and obesity among WWP Alumni are also slightly higher than those of OEF, OIF, and OND veterans who have used the VA health care system; an estimated 75 percent of OEF, OIF, and OND veterans who had clinical visits at VA are overweight or obese (Maguen et al., 2013). Because the majority of the sample falls into the overweight or obese category, the remaining analyses focus on the effects of higher BMI.

Body Mass Index Is Related to Other Physical Health Outcomes and Perceptions

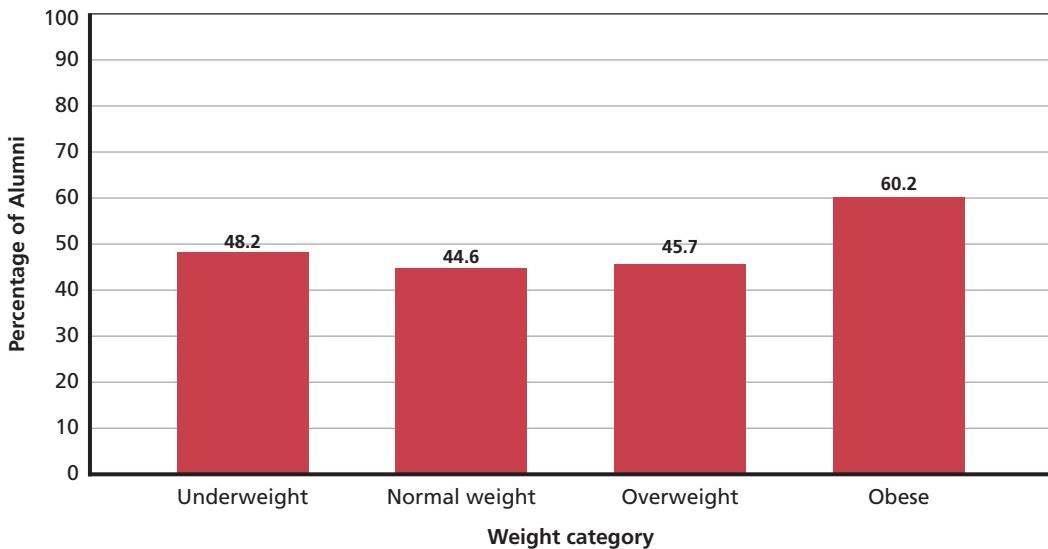
Because the high rates of overweight and obesity among WWP Alumni predisposes the group to health problems, this section includes further analysis of BMI's relationship to other physical health outcomes assessed in the 2014 WWP Annual Alumni Survey. A greater understanding of these relationships might guide future programs that aim to improve quality of life and physical health. Although the relationship between BMI and physical health is clear, it cannot be determined whether being overweight causes changes in physical health outcomes or vice versa, or whether a third factor could influence both BMI and other physical health outcomes (e.g., having clinical depression could affect both BMI and other health outcomes).

The 2014 WWP Annual Alumni Survey contains measures of general self-reported health, physical functioning, and exercise frequency. Measuring general self-reported health status requires respondents to reply to a question asking, "In general, would you say your health is . . ." and select one of the following response options: excellent, very good, good, fair, or poor (McHorney et al., 1994; McHorney, Ware, and Raczek, 1993; Ware and Sherbourne, 1992). Physical functioning is determined by using the Role Functioning—Physical measure from the RAND 36-Item Short-Form Health Survey (Hays, Sherbourne, and Mazel, 1993), then averaging responses (either 0 for "yes" or 100 for "no") to four questions about the extent to which physical health has interfered with work or activities (e.g., "cut down the amount of time you spent on work or other activities?"). So, lower scores indicate greater or more limitations because of physical health and higher scores indicate fewer or lesser limitations because of physical health. Exercise frequency is measured with a single item asking, "in a typical week, how many days do you do any moderate-intensity physical activity or exercise, such as a brisk walk, jog, cycle, play adapted sports, swim . . .?" There are eight response options for this question: less than once a week, one day a week, two days a week, three days a week, four days a week, five days a week, six days a week, and seven days a week (every day). The instrument also asks respondents to select which barriers made it difficult for them to exercise, do sports, or otherwise engage in physical activity.

Obese Alumni Are More Likely to Report Being in Fair or Poor Health

As illustrated in Figure 2.8, about 45 percent of WWP Alumni who are at normal weight or overweight reported that they are in fair or poor health, while 60 percent of obese Alumni reported the same. The high percentage of those reporting poor health, particularly among obese Alumni, demonstrates the quality-of-life issues present for many Alumni. A linear regression analysis reported in Appendix B.8 shows that, as BMI increases, self-reported health status declines.

Figure 2.8
Percentage of Alumni in Each Weight Category Reporting Fair or Poor Health Status



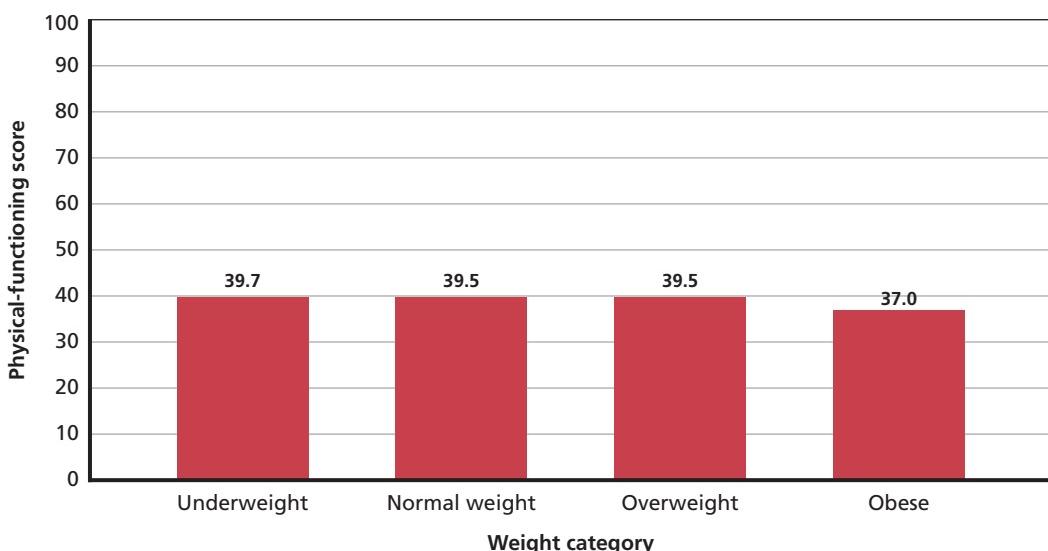
SOURCE: WWP, 2014.

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Obese Alumni Are More Likely to Report Being Limited Because of Their Health

Physical-functioning scores are low overall, with an average of 38.4 out of a possible 100 (see Figure 2.9). This relatively low score indicates that physical health often interferes with Alumni's work or other activities. Given that this study focused on a population that has experienced service-related health conditions, this is to be expected. A multiple regression analysis (see Appendix B.9) shows that, as BMI increases, physical-functioning scores decrease, indicating

Figure 2.9
Physical-Functioning Scores for Alumni in Each Weight Category



SOURCE: WWP, 2014.

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greater limitations. The average physical-functioning score for obese Alumni is 37.0, 2.5 points lower than for Alumni who are normal weight or overweight and 2.7 points lower than for Alumni who are underweight. These differences are just under the three-point threshold for being considered clinically important (Samsa et al., 1999).

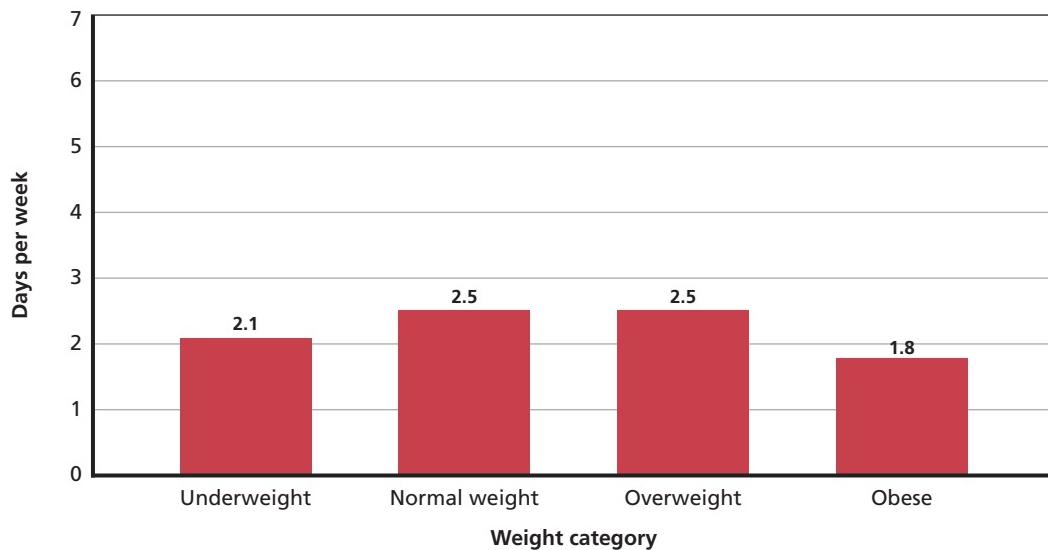
Obese Alumni Exercise Less Than Overweight or Normal-Weight Peers

When asked how many days in a typical week they spend doing moderate-intensity physical activity or exercise, such as a brisk walk, jog, cycle, playing adapted sports, or swimming, Alumni reported 2.2 days per week on average. Obese Alumni reported exercising 1.8 days per week, compared with 2.5 days reported by their overweight and normal-weight peers (see Figure 2.10). Multiple regression analysis (see Appendix B.10) shows that, as BMI increases, exercise frequency decreases.

Discomfort in Social Situations and Safety Concerns Are Common Barriers to Exercise

To better understand the low rates of weekly exercise among Alumni, we examined barriers to exercise and physical activity. In all categories, obese Alumni are more likely than their overweight and normal-weight peers to endorse barriers to exercise (see Figure 2.11). The most-common barriers endorsed across all groups were discomfort with social situations and concerns related to safety or reinjury. More than 40 percent of obese Alumni and more than 35 percent of normal-weight and overweight Alumni endorsed these barriers. Other commonly reported barriers outlined in Figure 2.11 include finding the time to participate in physical activity, physician restrictions, and other obstacles or barriers. Other barriers that respondents could choose (but that do not appear in Figure 2.11) include finding facilities that can accommodate Alumni, finding transportation to such facilities, learning where to find resources to help Alumni get involved, finding a local league to participate with others, find-

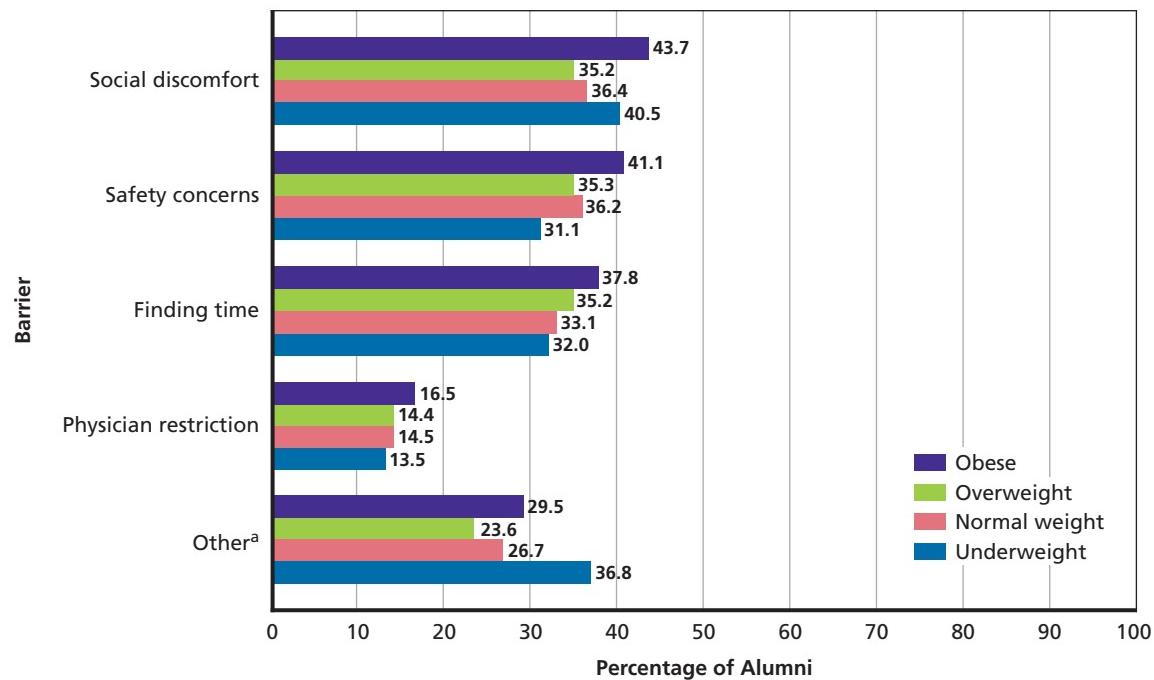
Figure 2.10
Days of Exercise per Week for Alumni in Each Weight Category



SOURCE: WWP, 2014.

RAND RR963-2.10

Figure 2.11
Top Reported Barriers to Exercise, Sports, or Physical Activity



SOURCE: WWP, 2014.

^aOther refers to the selection of "other barriers and obstacles" in response to the question.

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ing financial resources to support playing sports, finding adaptable equipment, and finding an instructor with training to teach people with disabilities or conditions.

Both Mental and Physical Service-Related Health Conditions Are Related to Perceptions of Health

Health professionals have long emphasized the interdependency of mental and physical health. Findings in the survey data demonstrate the close links between the two. Although many physical injuries are significantly correlated with reported health, the magnitude of the relationship with mental health conditions is often greater. This is particularly apparent among Alumni who screened positive for any probable depression.

Several Service-Related Health Conditions Are Associated with Increased Reports of Fair or Poor Health

Although 51.9 percent of Alumni reported being in fair or poor health, regression analysis (see Appendix B.8) gives greater insight into what types of health conditions are most likely to correlate with fair or poor health status. Alumni reporting the following service-related conditions are more likely than those without the condition to report fair or poor health status: ankle or foot injury (1.1 times); back, neck, or shoulder problem (1.3 times); depression (1.4 times); hip injury (1.2 times); migraine or other severe headache (1.3 times); nerve injury (1.3 times); sleep problem (1.2 times); or spinal-cord injury (1.6 times). Alumni reporting having amputation,

burns, or shrapnel problems are less likely to report fair or poor health than those without those health conditions. Highlighting the importance of mental health in health status, however, is the fact that Alumni who screened positive for any probable PTSD or any probable depression are 1.4 and 3.3 times more likely, respectively, to report being in fair or poor health than Alumni who did not screen positive for that disorder. Alumni who screened positive for any probable problem drinking are less likely to report being in fair or poor health than Alumni who did not screen positive for that disorder.

Alumni who identified as Hispanic or Latino or as black are 1.2 and 1.4 times more likely than white Alumni to report fair or poor health. Alumni are more likely to report fair or poor health status the older they are, with Alumni over the age of 50 being twice as likely to report fair or poor health than those ages 26 to 30. Higher VA disability ratings are associated with a greater likelihood of reporting fair or poor health, as is having a rating that is pending or on appeal. For example, Alumni with ratings of 90 to 100 percent are 2.2 times as likely to report being in fair or poor health as Alumni with ratings of 10 to 20 percent.

Few Alumnus Characteristics Are Meaningfully Associated with Levels of Physical Functioning

Although there is some variation in physical-limitation scores based on respondent characteristics, the magnitude of these changes is small (i.e., in most cases, less than three points on the 100-point scale). Appendix B.9 indicates all characteristics significantly associated with changes in physical functioning. Screening positive for any probable depression was the only characteristic associated with a change in magnitude of more than three points; on average, screening positive for any probable depression was associated with scoring 5.9 points lower on the physical-functioning scale than not screening positive for any probable depression.

Alumni Over the Age of 45 and Alumni with Probable Depression Reported Less-Frequent Exercise

Although an analysis shows that several service-related injuries or health conditions are associated with changes in exercise frequency, these are primarily small differences (less than 0.2 days per week) (see Appendix B.10). Alumni who screened positive for any probable depression exercised 0.8 days less per week than Alumni who did not screen positive. Exercise frequency decreased with age, with Alumni ages 46 to 50 exercising about 0.6 days less per week than Alumni ages 26 to 30. Active-duty Alumni reported exercising 0.8 days more, and activated National Guard and Reserve 0.5 days more, than Alumni who are out of the military.

Older Alumni, Severely Disabled Alumni, Alumni Reporting Spinal-Cord Injury, and Alumni Screening Positive for Any Probable Depression Reported the Greatest Limitations to Vigorous Activity

When asked whether their health severely limits vigorous physical activities, such as running, lifting heavy objects, or participating in strenuous sports (see Appendix B.11), older Alumni are more likely to indicate that they were limited “a lot.” Alumni older than 40 are at least 1.6 times as likely to report significant limitations to vigorous activity than Alumni ages 26 to 30, with Alumni over the age of 50 being about twice as likely to report being limited a lot. Women are 1.6 times more likely than men to report that their health placed a lot of limitations on vigorous activities. Active-duty and activated National Guard and Reserve are 1.9 and 1.6 times more likely, respectively, than Alumni out of the military to report the same.

Higher VA disability ratings unsurprisingly correlate with reports of limitations. At the most extreme, those with ratings of 90 to 100 percent are 3.3 times more likely than those with 10- to 20-percent ratings to report significant limitations to vigorous activity, though even those with 30- to 40-percent disability ratings are 1.6 times more likely to report the same. Alumni reporting the following service-related health conditions are more likely than those without the condition to report severe limitations: back, neck, and shoulder problems (1.6 times); nerve injury (1.8 times); and spinal-cord injury (2.1 times). Those who screened positive for any probable depression are 2.5 times more likely to report limitations to vigorous activity because of their health than those who did not screen positive, again highlighting the interdependent relationship between physical and mental health.

Wounded Warrior Project Programs Targeting Mental and Physical Health

WWP offers many programs that aim to promote the mental and physical well-being of its Alumni (see Table 2.2). We analyzed survey data to understand how program participants fare in terms of mental and physical health outcomes likely to be related to program participation.

We provide this analysis as a snapshot of mental and physical health outcomes among 2014 program participants, though we note that this analysis is limited for several reasons. First, it is unclear how a respondent was involved with the program when he or she took the survey. For example, we do not know whether a respondent who indicated that he or she had participated in a given program had just begun participation, had participated for sev-

Table 2.2
Wounded Warrior Project Programs Targeting Mental or Physical Health

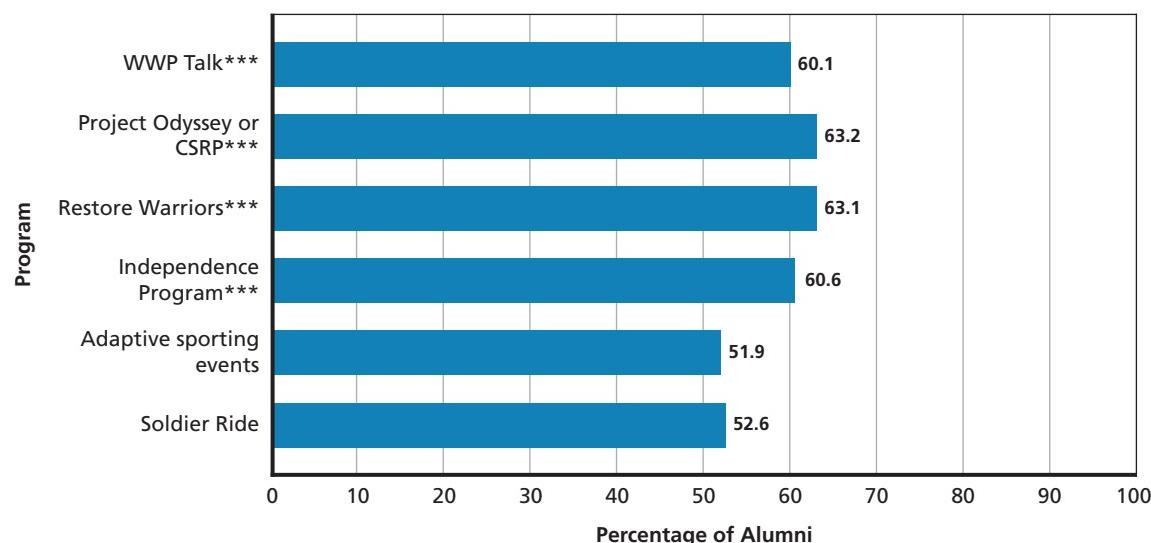
Program Name	Brief Description
Soldier Ride	"Soldier Ride is a unique four-day cycling opportunity for wounded service members and veterans to use cycling and the bonds of service to overcome physical, mental, or emotional wounds" (WWP, undated [f]).
Adaptive sporting events	"Inclusive sports allow warriors living with cognitive, emotional, and/or physical impairments to engage in local community-based activities to help overcome both visible and invisible injuries" (WWP, undated [d]).
Independence Program	"The Independence Program . . . is designed for warriors who rely on their families and/or caregivers because of moderate to severe brain injury, spinal-cord injury, or other neurological conditions. In addition, the warrior's cognitive or physical challenges limit [the warrior's] opportunities to access resources and activities in their own community. . . . The Independence Program provides support and training for involvement in meaningful activities, including social and recreational, wellness, volunteer work, education, and other living skills" (WWP, undated [b]).
Restore Warriors	"Restore Warriors is a website with resources and self-help strategies for warriors living with the invisible wounds of war, such as post-traumatic stress disorder (PTSD), combat and operational stress, or depression" (WWP, undated [e]).
Project Odyssey and CSRP	Project Odyssey is "an outdoor, rehabilitative retreat that promotes peer connection, challenging outdoor experiences, and healing with other combat veterans." Project Odyssey is part of WWP's broader CSRP, which "addresses the mental health and cognitive needs of warriors returning from war. CSRP provides services at key stages during a warrior's readjustment process" (WWP, undated [a]).
WWP Talk	"WWP Talk is a non-clinical, emotional support helpline. . ." A helpline supporter makes regularly scheduled, weekly calls to participating Alumni to provide support (Sivonda, 2014).

NOTE: CSRP = Combat Stress Recovery Program.

eral months, or had participated and stopped at some point. Second, few Alumni indicated participating in programs over multiple years (which is to be expected, given that many of the programs do not have a goal of long-term involvement), rendering a longitudinal analysis not feasible. Third, because the analysis is cross-sectional, we cannot state whether program involvement caused the outcome or is merely correlated with it.

For participants in each program, we explored several outcomes that are targeted across all programs—percentage of participants reporting fair or poor health status, percentage screening positive for any probable depression, and percentage screening positive for any probable PTSD. Figure 2.12 indicates that at least half of the participants in each of the listed WWP programs reported being in fair or poor health. Participants who reported participating in Soldier Ride and adaptive sporting events did not differ from participants who did not report participating in those programs on any of the three outcomes. However, participants who reported participating in four programs (Independence Program, Restore Warriors, Project Odyssey or CSRP, and WWP Talk) reported poorer self-reported general health status (see Figure 2.12) and more depression symptoms (see Figure 2.13) than the Alumni who did not participate in the program. Participants in three programs (Restore Warriors, Project Odyssey or CSRP, and WWP Talk) reported more PTSD symptoms than Alumni who did not report participating in the programs (see Figure 2.14). As mentioned earlier, there are many limitations to interpreting this analysis, but it could indicate that at least some of the programs target Alumni with the greatest health needs (i.e., poorer health status and poorer mental health).

Figure 2.12
Percentage of Alumni Who Report Participating in a Wounded Warrior Project Mental and Physical Health Program and Fair or Poor Health



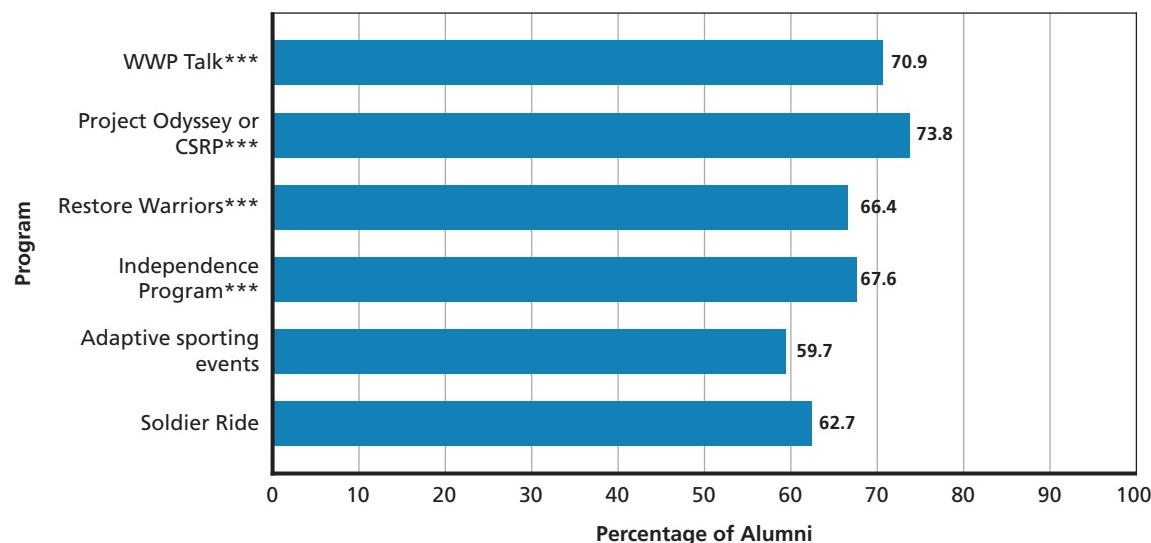
SOURCE: WWP, 2014.

***The difference between 2014 program participants and Alumni who did not report participating in the program is significant at the $p < 0.001$ level.

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Figure 2.13

Percentage of Alumni Who Report Participating in a Wounded Warrior Project Mental and Physical Health Program and Screen Positive for Any Probable Depression



SOURCE: WWP, 2014.

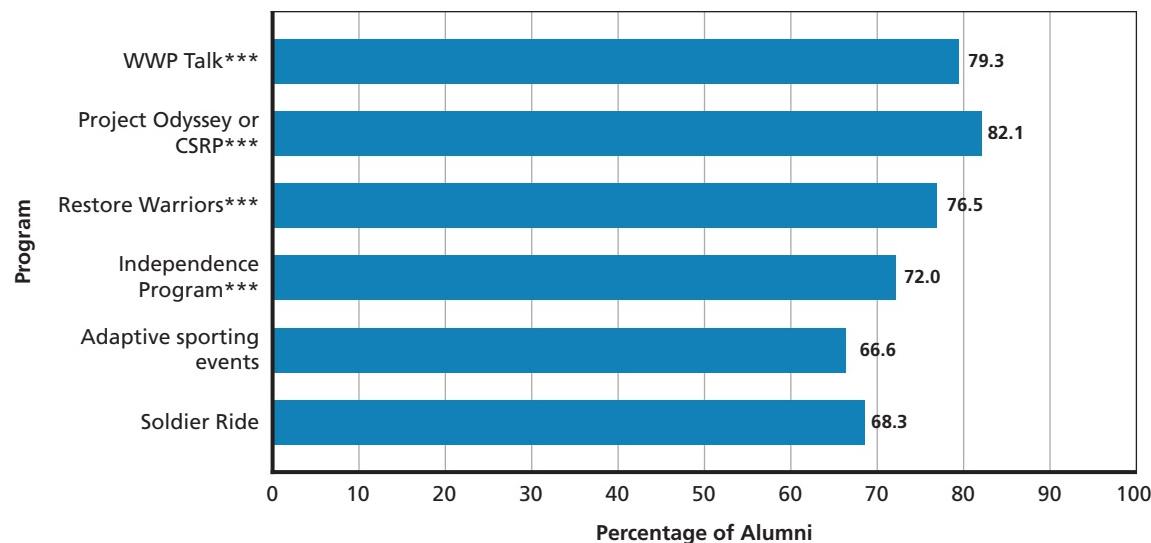
**The difference between 2014 program participants and Alumni who did not report participating in the program is significant at the $p < 0.01$ level.

***The difference is significant at the $p < 0.001$ level.

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Figure 2.14

Percentage of Alumni Who Report Participating in a Wounded Warrior Project Mental and Physical Health Program and Screen Positive for Any Probable Posttraumatic Stress Disorder



SOURCE: WWP, 2014.

***The difference between 2014 program participants and Alumni who did not report participating in the program is significant at the $p < 0.001$ level.

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Summary

Mental Health Findings

Like the 2013 WWP Annual Alumni Survey results, the 2014 survey results show that at least half of all WWP Alumni screened positive for any probable depression (61 percent of the sample), any probable PTSD (67 percent), or any probable problem drinking (53 percent). In addition, many Alumni screened positive for multiple probable mental health disorders (e.g., 51 percent screened positive for both probable depression and probable PTSD, and 27 percent screened positive for any probable depression, PTSD, and problem drinking). More than half of the Alumni screening positive for any probable depression, any probable PTSD, or any probable problem drinking said that they had seen a professional for help with mental health challenges; 70 percent of those with any probable depression reported seeing a professional in the prior three months, as did 67 percent of those with any probable PTSD and 52 percent of those with any probable problem drinking. Alumni who screen positive for any probable problem drinking are less likely to have seen a professional for potential mental health problems than Alumni who screened positive for any probable depression or any probable PTSD.

That a large proportion of those with symptoms of mental health conditions receive care is a positive finding. However, the 2014 survey results suggest also that many of those in need of care have difficulty, delay, or do not get it; 47 percent of Alumni who screened positive for any probable depression reported difficulty, delays, or not getting needed mental health care, as did 45 percent of those screening positive for any probable PTSD and 38 percent of those screening positive for any probable problem drinking. The most-common barriers to care reported by Alumni who screened positive for at least one probable mental health disorder include wanting to avoid talking about painful or traumatic memories, discomfort with DoD or VA resources, logistic challenges related to scheduling or treatment consistency, and concern about the effects that obtaining care can have on career plans.

Physical Health Findings

According to the 2014 WWP survey, more than 80 percent of WWP Alumni are above what is considered a normal body weight. Less than 1 percent fall in the underweight category, and only 17 percent fall into the normal-weight category; 39.5 percent are considered overweight, and 42.6 percent are obese. The prevalence rates of overweight among WWP Alumni are higher than the rates among the general U.S. population (27.2 percent for overweight). The prevalence rates of obesity are similar among WWP Alumni and the general population (41.3 percent). Alumni with higher BMIs are more likely than those with lower BMIs to report being in fair or poor health, being limited because of their health, and exercising less.

Mental and Physical Health Correlations

Among WWP Alumni, many types of service-related health conditions are significantly correlated with reports of health status, and the magnitude of the correlation is often greater for probable mental health disorders. This is particularly apparent among Alumni who screened positive for any probable depression; these Alumni are significantly more likely to report fair or poor health status, greater limitations because of health, reduced exercise frequency, and being limited a lot in performing vigorous activity than those who did not screen positive for any probable depression. Alumni who screened positive for any probable PTSD are more likely

than those who did not screen positive to report fair or poor health status, greater limitations because of health, and being limited a lot in performing vigorous activity.

Early Insight into Wounded Warrior Project Programs

WWP offers many programs that aim to promote the mental and physical well-being of its Alumni, including adaptive sporting events, online resources, and helplines. An examination of WWP program participants suggests that some programs are successfully targeting those Alumni with greater health challenges. For example, participants in four programs (Independence Program, Restore Warriors, Project Odyssey or CSRP, and WWP Talk) reported being in poorer health and experiencing more depression symptoms than Alumni who did not participate in these programs. Because the data are cross-sectional, however, we cannot discern individual program outcomes or why the programs draw certain Alumni. Because the survey includes a question asking only about whether a respondent participated in a program or not, we cannot know whether a respondent is currently participating. Also, for programs allowing for longer-term participation, we cannot know the duration of participation.

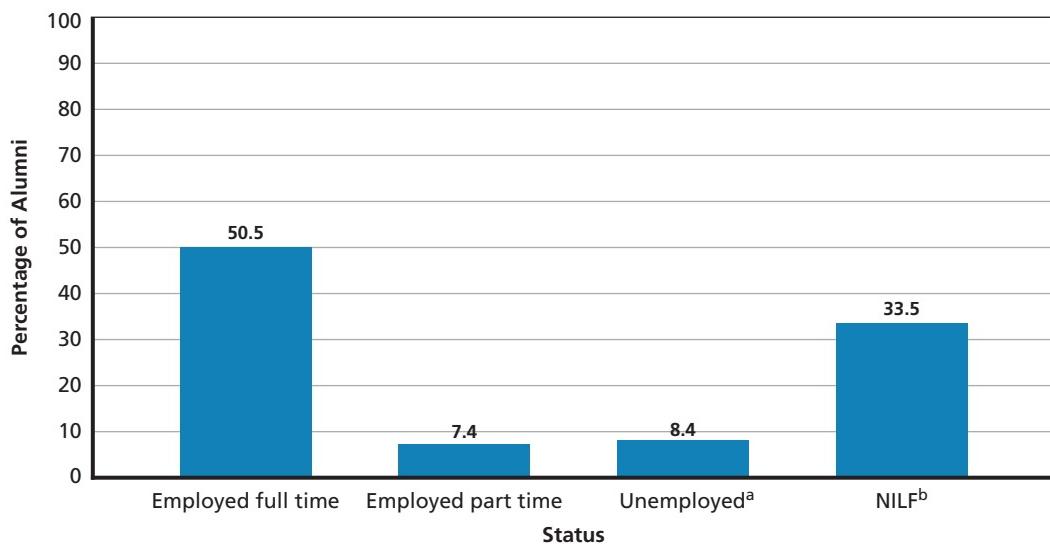
Education- and Employment-Related Outcomes

WWP's strategic objective 3 is to ensure that its Alumni are economically empowered. This chapter focuses on the relationship between Alumnus characteristics and education and employment outcomes among WWP Alumni.

Half of Alumni Are Employed

As indicated in Figure 3.1, 51 percent of Alumni are employed full time and 7 percent are employed part time. Unemployed Alumni currently looking for work make up 8 percent of the sample. About one-third of Alumni (34 percent) are not in the labor force (NILF), indicating that they have not looked for work in the past four weeks or would be unable to work if offered

Figure 3.1
2014 Alumnus Employment Status



SOURCE: WWP, 2014.

^a Weighted percentage of respondents who were not working but had looked for work in the past four weeks and could have accepted a job offer if they received one in the past week or who could have accepted a job offer except for temporary illness.

^b Weighted percentage of respondents who reported being unemployed but indicated that they did not look for work in the preceding four weeks or who could not have accepted a job offer if received.

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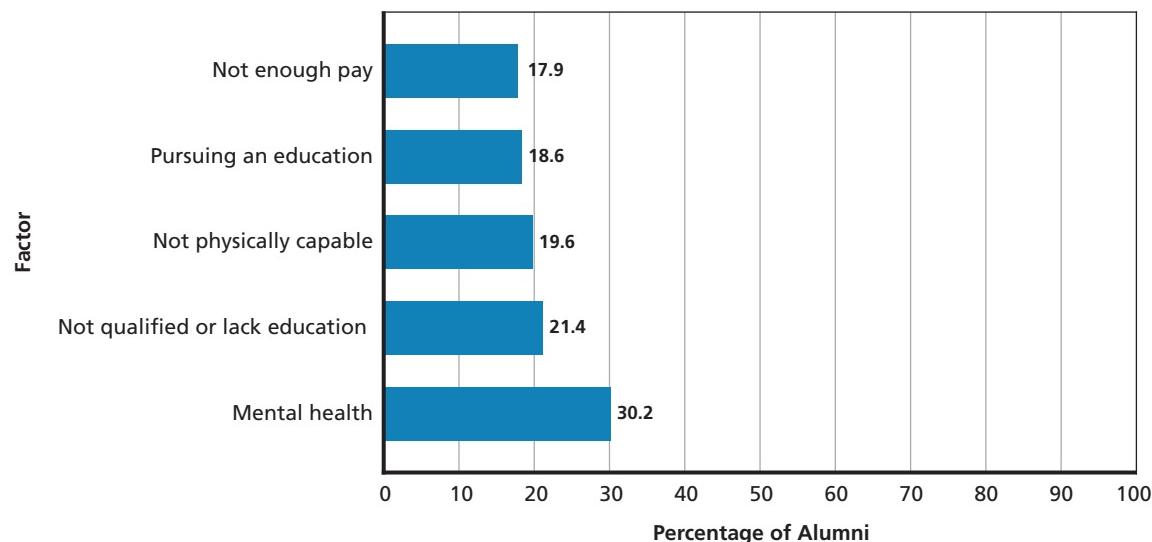
a job. A comparison of employment and unemployment of WWP Alumni to the general U.S. population and to the U.S. veteran population can be found in Franklin et al., 2014.

Among WWP Alumni, factors resulting in difficulties obtaining employment or changing jobs vary (see Figure 3.2). Mental health challenges are the most commonly cited reason for having difficulty obtaining employment or changing jobs, cited by 30 percent of Alumni. Physical limitations are also commonly cited, with 20 percent of Alumni reporting that employment difficulties are due to being not physically capable. Twenty-one percent of Alumni cited a lack of education, with 18 percent indicating that they could not find jobs with high-enough pay. In addition, 19 percent of Alumni cited their current pursuit of education as a factor making it difficult to obtain employment or change jobs.

High VA Disability Ratings Are Associated with Being Out of the Labor Force and Greater Unemployment If in the Labor Force

VA determines disability ratings in part by the average loss of earning capacity experienced because of someone's disability and are intended to reflect ability to work. Thus, we expect VA disability ratings to be related to being in the labor force and employment. As expected, higher VA disability ratings are associated with a greater likelihood of not being in the labor force. Alumni with ratings of 50 to 60 percent and 70 to 80 percent are 2.0 and 3.2 times more likely, respectively, than Alumni with ratings of 10 to 20 percent to be out of the labor force. The most-severely disabled Alumni (i.e., those with ratings of 90 to 100 percent) are 8.2 times more likely to be out of the labor force than those with ratings of 10 to 20 percent.

Figure 3.2
Top Five Factors Leading to Difficulty in Obtaining Employment or Changing Jobs Among 2014 Alumni



SOURCE: WWP, 2014.

NOTE: Alumni endorsed the factors above in response to the following survey item: "Which of the following factors make it more difficult for you to obtain employment or change jobs?"

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Appendix C.1 presents other characteristics associated to a lesser degree with being out of the labor force.

To further explore employment among Alumni who are in the labor force (i.e., those who are working or unemployed but looking for work), we conducted a logistic regression using only the subsample of respondents in the labor force (see Appendix C.2). Of those Alumni in the labor force, those with VA disability ratings of 50 percent or greater are significantly less likely to be employed full time or part time than Alumni with ratings of 10 to 20 percent. Appendix C.2 provides a full list of Alumnus characteristics associated with employment status.

The WWP Alumnus population is, by definition, one that includes service members and veterans with varying levels of disabilities that might affect their capacity to work. However, because we restricted the analysis to those who are in the labor force, the finding that Alumni with VA disability ratings of 50 percent or greater are less likely to be employed than those with lower VA disability ratings might signal that these Alumni might be in need of more assistance or services aimed to help them find employment.

Employment and Education Benefits Could Help More Alumni

In recognition of the need for transitional assistance for separated service members, numerous government-funded programs and benefits are available to aid service members and veterans. Examples of these programs include the VA Vocational Rehabilitation and Employment Program (VR&E) and the Post-9/11 GI Bill (otherwise known as the New GI Bill). VR&E is a congressionally authorized program that “assists veterans with service-connected disabilities to prepare for, find, and keep suitable jobs” and helps veterans with severe disabilities by offering “services to improve their ability to live as independently as possible” (VA, 2015b). To be eligible for VR&E, service members or veterans must have received or expect to receive discharge under conditions other than dishonorable. An active-duty service member must obtain a memorandum rating of 20 percent or greater from VA, and veterans must have a VA disability rating of 10 percent or greater (VA, 2014b). To approximate these eligibility criteria using the data available, we conducted our analyses using the 80 percent of the total sample with VA disability ratings of 10 percent or greater.

We find that 29 percent of Alumni with VA disability ratings of 10 percent or greater and who are currently enrolled in school reported using VR&E benefits; this constitutes 8 percent of all Alumni. Alumni with disability ratings of 30 percent or greater are at least two times more likely to use VR&E benefits than Alumni with lower ratings of 10 to 20 percent. Alumni of several racial and ethnic groups, including black and Hispanic or Latino, are 1.5 and 1.2 times more likely, respectively, than white Alumni to use these benefits, as are Alumni who reported having TBI (1.2 times more likely than those not reporting TBI). Alumni over the age of 40 are less likely than Alumni between the ages of 26 and 30 to use the benefits. Alumni who reported service-related health conditions of severe burns or migraine or other severe headache are less likely to use the benefits than Alumni not reporting these health conditions. Alumni who screened positive for any probable problem drinking are less likely to use VR&E benefits than Alumni who did not screen positive. Appendix C.3 reports a full description of characteristics associated with a difference in likelihood of using VR&E benefits.

The Post-9/11 GI Bill “provides financial support for education and housing to individuals with at least 90 days of aggregate service after September 10, 2001, or individuals discharged with a service-connected disability after 30 days” (VA, 2015a). Of Alumni who were enrolled in school at the time of the survey, 57 percent reported using Post-9/11 GI Bill benefits; this represents 15 percent of all Alumni.

Alumni in the following racial and ethnic groups are more likely than white Alumni to use Post-9/11 GI Bill benefits: black (1.4 times), Hispanic or Latino (1.2 times), Asian (1.4 times), and Alumni who selected multiple races or ethnicities (1.3 times). Alumni ages 18 to 25 are 1.3 times more likely than Alumni between the ages of 26 and 30 to use these benefits, and Alumni over the age of 30 are less likely. Alumni with ranks of E-5 to E-9 or O-1 to O-3 are 1.4 and 1.9 times more likely, respectively, than E-1 to E-4 Alumni to use the benefits. Disability rating was not strongly related to benefit use, though the most–severely disabled Alumni, with ratings of 90 to 100 percent, are less likely than those with lower ratings, of 10 to 20 percent, to use the benefit. Reporting service-related knee injury or problem was associated with a greater likelihood of using the benefit than not reporting such injury, and reporting amputation or TBI was associated with a decreased likelihood. Appendix C.4 reports a full description of characteristics associated with a difference in likelihood of using Post-9/11 GI Bill benefits.

Wounded Warrior Project Programs Targeting Education and Employment

WWP offers many programs that aim to promote positive education and employment outcomes for Alumni (see Table 3.1). We analyzed survey data to understand how program participants indicated that they used what they had learned from the programs to further their education or employment.

As with our earlier analysis in Chapter Two exploring WWP program participation and mental and physical health outcomes, we note several major limitations. As with those analyses, it is unclear how Alumni were involved with the program at the time in which they took the survey (e.g., whether they were beginning participation, were midway through, or had terminated involvement). Also, these analyses are cross-sectional and not longitudinal in nature, limiting our ability to draw conclusions about whether program involvement caused changes in outcomes or are merely correlated with them. Because the survey includes a question asking only about whether a respondent participated in a program or not, we cannot know whether a

Table 3.1
Wounded Warrior Project Programs Targeting Employment or Education

Program Name	Brief Description
TRACK	“TRACK is the first education center in the nation specifically for Wounded Warriors with facilities located in Jacksonville, Florida and San Antonio, Texas. The 12-month program gives warriors a jump-start on meeting their educational goals, while also supporting goals around personal health and wellness, mental health and career development” (WWP, undated [g]).
Transition Training Academy	Transition Training Academy is “a hands-on program that helps [WWP Alumni] explore the information-technology (IT) field as a possible career choice . . . [it] is especially beneficial for those warriors who live with TBI or PTSD” (WWP, undated [h]).
Warriors to Work	“The Warriors to Work program provides career guidance and support services to WWP Alumni interested in transitioning to the civilian workforce. [WWP matches] your skills and experience to the needs of hiring managers” (WWP, undated [i]).

participant is currently participating or has ceased participation. Also, for programs allowing for longer-term participation, we cannot know the duration of participation.

The Annual Alumni Survey asked participants who indicated that they participated in at least one of the three WWP employment or education programs in Table 3.1 how they used the programs. Table 3.2 shows responses to this item for the 1,753 Alumni who indicated that they participated in at least one of the programs. About one-third of program participants indicated that they received employment preparation, which included assistance in the form of resume writing, practice interviews, workshops, and job placement services. Just over 12 percent reported obtaining full-time employment in the civilian workforce as a result of their participation. Smaller percentages of Alumni endorsed other activities. Because the survey asked only program participants about the outcomes in the table, we cannot compare the proportion of Alumni engaging in these activities and the full sample.

Summary

In 2014, 51 percent of Alumni were employed full time, and 7 percent were employed part time. Unemployed Alumni looking for work represented 8 percent of the sample, while 34 percent were not looking for work or could not accept if work were offered. WWP Alumni cited a variety of challenges to obtaining work or changing jobs, including mental and physical health challenges (30 percent and 20 percent, respectively). Other challenges cited include a lack of education (21 percent), not being able to find jobs with high-enough pay (18 percent), and pursuing an education (19 percent).

Table 3.2
Reported Uses of Program Skills Among Alumni Who Participated in TRACK, Transition Training Academy, or Warriors to Work

Possible Use of Program Skills	Percentage of Participating Alumni Who Endorsed Possible Use
Completed college or university coursework	6.2
Completed an associate, bachelor, or graduate degree as a result of participating in TRACK	2.6
Completed business, technical or vocational school training	4.3
Received a business, technical, or vocational school training certificate as a result of participation in TRACK	2.4
Completed an apprenticeship or on-the-job training program	2.8
Obtained full-time employment in civilian workforce	12.3
Obtained part-time employment in civilian workforce	2.8
Obtained reclassification or retraining to stay active-duty military	0.3
Employment preparation, such as resume writing, practice interviews, workshops, or placement services	32.1
None of the above	49.1

SOURCE: WWP, 2014.

As in the 2013 sample, more WWP Alumni could take advantage of federal veteran employment and education benefits. Of Alumni enrolled in school, less than one-third reported that they were using VR&E benefits. A larger percentage, 57 percent, reported using the Post-9/11 GI Bill. Alumni who are black, Hispanic, or Latino are more likely than white Alumni to use either benefit, and Alumni who identified as Asian or being of multiple races or ethnicities are also more likely than white Alumni to use the Post-9/11 GI Bill. Disability rating was not strongly related to benefit use, though the most-severely disabled Alumni, with ratings of 90 to 100 percent, are less likely to use Post-9/11 GI Bill benefits than those with lower ratings of 10 to 20 percent.

WWP offers a variety of programs that promote positive education and employment outcomes for Alumni. Limited data suggest that about one-third of program participants engage in a variety of employment preparation activities as part of the programs, and just over 12 percent cited their participation in these programs as enabling them to secure full-time employment.

Recommendations

In this chapter, we draw on the findings in this report to offer several recommendations to guide WWP as it determines how best to meet the needs of the Alumni it serves.

Mental Health

Recommendation 1: Review Existing Capabilities or Consider Introducing New Capabilities for Identifying and Referring or Intervening with Alumni Experiencing Mental Health Symptoms

WWP already offers various programs, such as CSRP, and individual support to Alumni and their families, as well as assistance with a range of behavioral health issues, such as stress, anger, relationship problems, self-esteem issues, self-care challenges, loss, depression, alcohol abuse, and drug abuse. However, our analysis showed that more than half of Alumni screened positive for any probable depression, any probable PTSD, or any probable problem drinking, indicating that these Alumni reported experiencing symptoms at the time they completed the survey. In addition, more than half of Alumni who had screened positive for any probable depression, any probable PTSD, or any probable problem drinking said they had seen a professional in the past three months for such issues as “stress, emotional, alcohol, drug, or family problems.” Although the rates of getting professional help are high, they could be higher. Thus, WWP should bolster existing efforts and consider adding new efforts to appropriately refer or intervene with Alumni who are actively experiencing symptoms.

Recommendation 2: Explore Ways to Help Wounded Warrior Project Alumni Access Mental Health Care

Our analysis showed that 38 to 47 percent of Alumni who screened positive for at least one probable mental health disorder reported delaying, not getting, or having difficulty getting needed mental health care. These Alumni all reported the same top five barriers to care:

- wishing to avoid bringing up painful or traumatic memories
- having difficulty scheduling appointments
- having inconsistent treatment or lapses in treatment
- feeling uncomfortable with existing DoD or VA resources
- being concerned that future career plans could be jeopardized by obtaining treatment.

Because self-reported barriers to care do not always predict treatment-obtaining behavior (Hoerster et al., 2012), we recommend that WWP take a more comprehensive approach to

assessing treatment. We recommend assessment of facilitators, as well as barriers, of care and consideration of how WWP programs and service offerings can both reduce barriers and bolster facilitators of care. Efforts to promote obtaining care should be evidence-based where possible. For example, implementing illness management and recovery, an evidence-based practice with the goal of helping people with mental illness “manage their illnesses, find their own goals for recovery, and make informed decisions about their treatment by teaching them the necessary knowledge and skills” (Substance Abuse and Mental Health Services Administration, 2009), might be an effective strategy for helping WWP Alumni reduce the barriers of inconsistent treatment or lapses (by helping Alumni to engage more proactively in their own care) and feeling uncomfortable with existing DoD and VA resources (by educating Alumni about their treatment options and positioning them to be informed participants in the treatment process).

Recommendation 3: Pursue a Greater Understanding of the Health Needs and Service Preferences of Wounded Warrior Project Alumni Who Might Have Alcohol-Use Problems

Fifty-three percent of WWP Alumni screened positive for any probable problem drinking. However, these Alumni are less likely to report receiving care than those who screened positive for any other mental health disorders, such as depression or PTSD. We recommend that WWP consider a targeted effort to better understand the health needs and service preferences of Alumni with any potential alcohol-use problems.

Physical Health

Recommendation 4: Continue Emphasizing Weight Maintenance and Loss

Obesity is a major public health challenge among the general population, so it is not surprising that it affects WWP Alumni as well. Through its Physical Health and Wellness program, WWP addresses issues of fitness, nutrition, and wellness by enabling Alumni to participate in activities, such as adaptive sports, yoga, scuba diving, cycling, and culinary education. Because of the high rates of overweight and obesity among the WWP Alumnus population and accompanying negative health outcomes (e.g., greater reports of fair or poor health and more physical limitations), we recommend that WWP continue its focus on weight maintenance or loss. Although many programs address physical activity among WWP Alumni, physical activity is only one piece of the weight-loss puzzle. WWP might wish to look to the VA system for examples of weight-maintenance or weight-loss interventions that have been successful among veteran populations (e.g., the MOVE! weight management program), or it might wish to make efforts to increase referrals of WWP Alumni to existing VA weight-loss resources.

Education and Employment

Recommendation 5: Increase Efforts to Address Education and Employment Needs of Wounded Warrior Project Alumni, Especially Those with VA Disability Ratings of 50 Percent or Greater

WWP aims to increase the economic well-being of all of its Alumni and provides opportunities to Alumni through various programs, such as Education Services, the yearlong TRACK program, and the Transition Training Academy. Data from the 2014 Annual Alumni Survey

indicate that, among Alumni in the labor force, Alumni with VA disability ratings of 50 percent or greater are less likely to be employed than those with lower disability ratings. This group might face extra challenges to employment than those with lower VA disability ratings do not face. WWP might wish to focus extra attention on this population and on existing programs targeting this population to identify how best to address barriers to their employment.

Recommendation 6: Explore Why Wounded Warrior Project Alumni Do Not Participate in the Labor Force

Just over one-third of WWP Alumni are not in the labor force. Many Alumni might be out of the labor force because of the nature or severity of their service-related health conditions, but others might not seek employment for other reasons. WWP might wish to explore reasons Alumni do not participate in the labor force, focusing in particular on those who initially sought employment and later left the labor force, to determine whether specific barriers exist for those who wish they were employed.

General Recommendation

Recommendation 7: Commission an Objective, External Evaluation of Wounded Warrior Project Programs to Determine Their Effects on Outcomes of Interest

WWP offers a wide range of programs designed to improve the mental health, physical health, and economic well-being of service members and veterans who incurred service-related health conditions. In addition to the Annual Alumni Survey, WWP regularly monitors progress toward annual goals and program objectives and tracks key performance indicators. However, WWP could benefit from commissioning an objective, external evaluation from a firm with evaluation expertise to complement internal measurement efforts. Such an evaluation could help provide a more-comprehensive understanding of whether and how program participation results in desired changes in outcomes.

Appendices

Survey Methods, Sample Characteristics, Analysis Strategy, and Interpretation of Results

This appendix provides context to our analysis of the 2014 WWP Annual Alumni Survey. First, we describe the administration of the survey, its content, and respondent characteristics. Additional information on the survey methods and respondents are available in the Westat report (Franklin et al., 2014). We then provide a brief description of the analysis strategy—regression analysis—used to generate the results presented in this report and provide a guide to interpreting the analyses.

Survey Content

The 2014 WWP Annual Alumni Survey is the fourth in a series of annual surveys of WWP Alumni, and it is based on content developed jointly by RAND and Westat for the initial WWP Annual Alumni Survey in 2011. Survey questions cover respondent characteristics, mental health outcomes, physical health outcomes, educational outcomes, and economic outcomes. Table A.1 contains a list of the survey content discussed in this report.

Table A.1
Wounded Warrior Project Annual Alumni Survey Content Addressed in This Report

Category	Content
Respondent characteristics	Demographic characteristics (e.g., age, gender, and race) Military service (e.g., branch of service, service component, and highest pay grade reached) Type of service-related injury or health condition VA disability rating
Mental health outcomes	Validated screening measures for probable depression, PTSD, and problem drinking Receipt of mental health care Difficulty in obtaining needed mental health care
Physical health outcomes	BMI General self-reported health status Frequency of exercise Physical limitations
Economic and educational outcomes	Employment status Use of government work and education benefits

Survey Administration

Westat administered the 2014 survey online during a seven-week period in March and April 2014. A census of WWP Alumni was attempted in that all WWP Alumni in the WWP database were invited to participate. Each potential participant was offered a small gift (a tumbler with the WWP logo) as an incentive to participate.

Sample Characteristics

In 2014, 21,120 WWP Alumni (that is, 49 percent of the 43,071 eligible Alumni in the database) completed the survey. Table A.2 reports a full listing of the characteristics of the WWP

Table A.2
2014 Wounded Warrior Project Annual Alumni Survey Sample Characteristics

Characteristic	Number of Respondents Reporting Characteristic	Unweighted Percentage of the Total Number of Respondents	Weighted Percentage of the Total Number of Respondents
Gender			
Male	18,145	86.5	86.2
Female	2,832	13.5	13.8
Age, in years			
18–25	841	4.0	10.9
26–30	4,174	19.9	22.1
31–35	5,906	28.1	26.5
36–40	3,394	16.2	13.6
41–45	2,880	13.7	11.6
46–50	2,141	10.2	8.5
51–55	1,092	5.2	4.4
56+	586	2.8	2.3
Race or ethnicity ^a			
White	14,965	71.4	71.3
Black	2,248	10.7	10.2
Hispanic or Latino	3,224	15.4	16.1
American Indian or Alaska Native	590	2.8	4.0
Asian	857	4.1	2.8
Native Hawaiian or other Pacific Islander	221	1.1	1.2
Other	529	2.5	2.5

Table A.2—Continued

Characteristic	Number of Respondents Reporting Characteristic	Unweighted Percentage of the Total Number of Respondents	Weighted Percentage of the Total Number of Respondents
Multiple races or ethnicities selected	1,414	6.7	6.8
Marital status			
Married	14,018	66.7	64.9
Previously married (widowed, divorced, or separated)	4,189	19.9	19.2
Never married	2,804	13.4	15.9
Educational attainment			
Less than 12th grade	53	0.3	0.3
High school diploma	2,645	12.5	14.4
GED	678	3.2	3.4
Business, technical, or vocational certificate	914	4.3	4.2
Some college (<1 year)	2,592	12.3	13.1
Some college (1+ year)	5,475	26.0	26.4
Associate's degree	2,997	14.2	13.6
Bachelor's degree	3,919	18.6	17.0
Master's degree	1,631	7.7	6.8
Professional or doctorate degree	186	0.9	0.8
Employment status			
Full time	9,515	47.7	50.5
Part time	1,473	7.4	7.4
Unemployed or NILF ^{b, c}	8,976	45.0	42.0
Unemployed ^b	1,741	8.7	8.4
NILF ^c	7,235	36.2	33.5
Health insurance ^a			
None	766	3.6	4.1
Private insurance	4,404	20.9	19.5
Medicare	2,488	11.8	10.6
Medicaid	525	2.5	2.3
VA	13,128	62.3	59.2

Table A.2—Continued

Characteristic	Number of Respondents Reporting Characteristic	Unweighted Percentage of the Total Number of Respondents	Weighted Percentage of the Total Number of Respondents
Other government (e.g., TRICARE, CHAMPUS)	9,775	46.4	47.4
Other	432	2.1	2.1
Service component			
Active duty	2,238	10.6	14.0
Activated National Guard or Reserve	1,010	4.8	5.69
National Guard or Reserve (not activated)	1,916	9.1	9.15
Out of the military	15,907	75.5	71.2
Retired, medical	7,244	34.4	32.6
Retired, nonmedical	1,742	8.3	6.7
Separated or discharged	6,921	32.8	31.9
Branch of service			
Army	14,056	66.6	66.1
Marine Corps	3,502	16.6	17.2
Air Force	1,763	8.3	8.0
Navy	2,082	9.9	9.1
Coast Guard	105	0.5	0.5
More than one branch	1,315	6.2	5.4
Highest pay grade^d			
E-1–E-4	5,846	29.7	34.0
E-5–E-9	13,410	68.1	64.0
W-1–W-5	118	0.6	0.5
O-1–O-3	192	1.0	0.9
O-4–O-6	118	0.6	0.6
Total number of deployments			
0	1,087	5.3	6.1
1	6,231	30.4	32.8
2	5,634	27.5	27.3
3+	7,521	36.7	33.7

Table A.2—Continued

Characteristic	Number of Respondents Reporting Characteristic	Unweighted Percentage of the Total Number of Respondents	Weighted Percentage of the Total Number of Respondents
VA disability rating (%)			
0	97	0.5	0.5
10–20	790	3.8	3.8
30–40	1,712	8.1	8.0
50–60	2,778	13.2	12.9
70–80	4,625	22.0	21.0
90–10	7,011	33.3	30.8
No VA disability rating	2,199	10.4	12.8
Claim pending	1,860	8.8	10.4
Type of service-related health condition reported ^{a, e}			
Amputation	473	2.2	2.3
Ankle or foot injury	7,658	36.3	35.8
Anxiety	13,647	64.8	64.2
Back, neck, or shoulder problem	15,453	73.3	72.3
Blindness or severe vision loss	509	2.4	2.5
Burn, severe	521	2.5	2.5
Depression	14,459	68.6	67.1
Fractured bone	3,937	18.6	19.3
Hand injury	3,812	18.0	18.2
Head injury other than TBI	2,936	13.9	13.9
Hearing loss	10,301	48.9	48.3
Hip injury	2,874	13.6	13.7
Knee injury or problem	10,883	51.7	50.7
Migraine or other severe headache	10,603	50.2	49.8
Military sexual trauma	1,243	5.9	6.0
Nerve injury	6,286	29.8	29.6
PTSD	16,199	76.9	75.2
Shrapnel problem	1,934	9.2	9.5
Sleep problem	16,228	76.8	75.8
Spinal-cord injury	3,329	15.8	15.5

Table A.2—Continued

Characteristic	Number of Respondents Reporting Characteristic	Unweighted Percentage of the Total Number of Respondents	Weighted Percentage of the Total Number of Respondents
TBI	9,049	42.9	43.2
Tinnitus	11,745	55.7	54.5
Other severe physical injury	3,740	17.8	17.8
Other severe mental injury	2,374	11.3	11.2
No injury reported ^f	143	0.7	0.7

NOTE: Total sample size for the survey is 21,120. All data used in this analysis are from WWP, 2014 (for more info, see Franklin et al., 2014). Some responses might sum to less than 100 percent because of missing responses or rounding. In cases in which the respondent could choose more than one response, totals might sum to greater than 100 percent.

^a The respondent could choose more than one response.

^b The unemployed figure includes respondents who were not working (either full or part time) but who had looked for work in the past four weeks and could have accepted work if offered in the past week or who could have accepted work if not for a temporary illness. We calculated the unemployment percentage by dividing the number of unemployed respondents by the number of respondents in the labor force.

^c We assumed that any respondent who reported being unemployed but indicated that he or she did not look for a job in the preceding four weeks or who could not have accepted a job offer if received was NILF.

^d Because so few respondents indicated pay grades of O-7 to O-10, we do not report their data so as not to risk their being identifiable.

^e Respondents reported type of injury in response to a close-ended survey item asking them to “please indicate any severe physical or mental injuries or health problems you experienced while serving in the military after September 11, 2001.”

^f This group is small ($n = 143$) and is not representative of service members and veterans who do not experience service-related health conditions.

Alumnus respondents. The column containing unweighted percentages shows the percentage of survey respondents who endorsed the response in each row. The table also reports weighted percentages that represent the percentage of all WWP Alumni who would have that characteristic.

In terms of demographic characteristics, 87 percent¹ of survey respondents were male, and 71 percent were white. Nearly half of the sample were between the ages of 26 and 35, and 67 percent were married. In terms of education, about 41 percent had completed associate’s degrees or higher. Forty-eight percent of respondents were employed full time, with an additional 8 percent employed part time. Most respondents (62 percent) reported having health insurance through VA, with an additional 46 percent reporting some other form of government health care (e.g., TRICARE or CHAMPUS). Most respondents had served in the Army (67 percent) and had pay grades between E-5 and E-9 during their time in service (68 percent). However, most were out of the military (76 percent) at the time of the survey. Because WWP serves service members and veterans who incurred service-related health conditions, it is not surprising that most respondents (69 percent) had VA disability ratings of 50 percent or higher. Respondents reported many different types of service-related injuries, with 50 percent or more of the sample reporting each of the following: anxiety (65 percent); back, neck, or shoulder

¹ We have not weighted the percentages in this paragraph.

problem (73 percent); depression (69 percent); knee injury or problem (52 percent); migraine or other severe headache (50 percent); sleep problem (77 percent); PTSD (77 percent); and tinnitus (56 percent).

Analysis Strategy

We used regression analyses to understand how WWP Alumni fare on different outcome measures. Regression analysis techniques allow for the exploration of correlational relationships among many different variables. In all regression analyses, respondent characteristics (e.g., age, gender, and military pay grade) serve as explanatory variables that can explain variation in

Table A.3
Explanatory Variables Used in Regression Analyses on Alumnus Characteristics

Variable	Possible Values (Reference Group in Bold)
Gender	Male , female
Race or ethnicity	White , black, Hispanic or Latino, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, other, multiple races or ethnicities selected
Age	18–25, 26–30 , 31–35, 36–40, 41–45, 46–50, 51–55, 56+
Marital status	Currently married , previously married, never married
Branch of service ^a (ever served)	Army , Navy or Coast Guard ^a , Marine Corps, Air Force, multiple branches
Service component at the time of the survey	Active duty, activated National Guard or Reserve, National Guard or Reserve (not activated), out of the military
Highest rank ^b	E-1–E-4 , E-5–E-9, W-1–W-5, O-1–O-3, O-4–O-6 (O-7 and up omitted from analyses ^b)
VA disability rating (%)	0, 10–20 , 30–40, 50–60, 70–80, 90–100, pending or under appeal, no rating
Service-related injury type ^c	Amputation; ankle or foot injury; anxiety; back, neck, or shoulder problem; blindness or severe vision loss; burn, severe; depression; fractured bone; hand injury; head injury other than TBI; hearing loss; hip injury; knee injury or problem; migraine or other severe headache; military sexual trauma; nerve injury; PTSD; shrapnel problem; sleep problem; spinal-cord injury; TBI; tinnitus; other severe physical injury; other severe mental injury; no physical or mental health injury or health problem
Any probable depression	Positive screen for any probable depression; negative screen for any probable depression
Any probable PTSD	Positive screen for any probable PTSD; negative screen for any probable PTSD
Any probable problem drinking	Positive screen for any probable problem drinking; negative screen for any probable problem drinking

NOTE: Respondents reported injury-type variables in response to the item asking them to "please indicate any physical or mental injuries or health problems you experienced while serving in the military after September 11, 2001."

^a Because, during wartime, the Coast Guard falls under the Department of the Navy, we combined respondents who reported serving in the Navy or Coast Guard into one category for analysis.

^b Because the number of respondents with pay grades of O-7 and up is small, we omitted this group from analyses to eliminate any risk of their being identifiable.

^c Because injury types are not mutually exclusive, the reference group for each type of injury is the set of respondents who did not report having that injury.

outcome measures (see Table A.3 for explanatory variables and reference groups). For example, if we use respondents' service components (i.e., active duty, activated National Guard and Reserve, not activated National Guard and Reserve, and out of the military) as explanatory variables when looking at BMI, the results can provide information about how service component and BMI are related in the sample of WWP Alumni. We entered all explanatory variables into the analysis simultaneously. We used listwise deletion to handle missing data; that is, we excluded from the analysis any cases for which data points were missing, resulting in different numbers of respondents included in each analysis.

We often present results in terms of reference groups. That is, in a regression analysis exploring the relationship between an Alumnus characteristic and an outcome, the effects of one characteristic are presented relative to those for a reference group for that characteristic. So, for example, in an analysis exploring the relationship between the branch of service in which Alumni served and self-reported health status, a significant result could occur for the Air Force variable. The effect of having served in the Air Force (the Alumnus characteristic of interest) on health status (the outcome) is interpreted in reference to being in the Army (the reference group for the Alumnus characteristic for which there is a significant result).

Caution should be used when interpreting significant results for the any-probable-depression, any-probable-PTSD, and any-probable-problem-drinking variables. For example, an analysis could yield a significant result for the association between any probable PTSD variable and an outcome variable. We would interpret this finding in the following manner: Alumni with any probable PTSD (i.e., a positive screen for probable PTSD only or positive screens for probable PTSD and at least one other disorder) reported different levels of the outcome variable from the reference group of Alumni who did not screen positive for any probable PTSD (i.e., Alumni who did not screen positive for any probable disorder, Alumni who screened positive for probable depression only, Alumni who screened positive for probable problem drinking only, and Alumni who screened positive for both depression and problem drinking). One limitation to the analysis strategy is that, because no variable in our analysis accounts specifically for positive screens for multiple mental health disorders, we cannot directly compare Alumni with single probable mental health disorders and Alumni experiencing multiple probable mental health disorders. It was beyond the scope of this report to conduct these analyses, but, in the future, we hope to explore this issue more thoroughly.

When reporting the results of regression analysis, we present tables that contain some indicator of the strength of the correlation between an explanatory variable and the outcome variable being considered. We next describe in detail when we use two different types of regression—ordinary-least-squares multiple regression and logistic regression—and how to interpret the resulting regression tables.

Multiple Regression

We use ordinary-least-squares regression (referred to throughout this report as multiple regression) when the outcome variable of interest is continuous (e.g., BMI, an indicator of overweight and obesity than can take any value in a range of about 15 to 40, with greater numbers indicating obesity). The results of a multiple regression analysis take the form of a table showing regression coefficients for each explanatory variable used in the analysis. We can interpret these coefficients as the incremental change in the outcome under analysis for every unit change in

the explanatory variable, holding all other explanatory variables in the model constant. For example, consider a simple (and fictitious) analysis exploring the relationship between highest pay grade achieved (the explanatory variable) on BMI (the outcome variable). If the coefficient for the variable indicating that an Alumnus achieved a highest rank of E-5 to E-9 is 4, that implies that those who achieve ranks of E-5 to E-9 have BMIs that are four units higher, on average, than those with ranks of E-1 to E-4 (the reference group designated for this variable; see discussion of explanatory variables below), holding all other explanatory variables constant. This higher coefficient would indicate that those with ranks of E-5 to E-9 are more likely to be overweight than those with ranks of E-1 to E-4.

Logistic Regression

We use logistic regression when the outcome variable of interest is dichotomous (i.e., when the variable takes on one of two values). An example of dichotomous variable is self-reported health status. For this variable, it is typical to code responses of “fair” or “poor” with one numeric value (e.g., 1) and responses of “excellent,” “very good,” or “good” as another (e.g., 0). For logistic regression results, tables contain odds ratios, which can be interpreted as the odds that an outcome will occur given a particular characteristic versus the odds of the outcome occurring in the absence of that characteristic. For example, consider a simple (and again, fictitious) analysis exploring the relationship between highest pay grade achieved (the explanatory variable) and self-reported health status (the outcome variable, coded as a 0 for good health and 1 for poor health as described above). An odds ratio *greater* than 1 would indicate that respondents of ranks E-5 to E-9 would be *more* likely to be in poor health than those of ranks E-1 to E-4. An odds ratio *less* than 1 would indicate that respondents of ranks E-5 to E-9 would be *less* likely to be in poor health than those of ranks E-1 to E-4.

Explanatory Variables

As explained above, we included some explanatory variables in the analyses, and the standard set of explanatory variables entered simultaneously in all analyses appears in Table A.3. For most of the variables in that table, one level is designated as the reference group, and this group appears in bold type in the table. Because injury types are not mutually exclusive (i.e., respondents could indicate multiple injury types), each injury serves as an independent explanatory variable. Thus, the reference group for a given injury would be the set of respondents who did not report that injury.

When a statistically significant regression coefficient or odds ratio results from an analysis, we can interpret that as the change for one level of the explanatory variable relative to the level for the reference group for the explanatory variable. In the regression tables in the appendixes that follow, we include the reference groups in the tables for ease of interpretation. They appear next to variable headings (e.g., “Gender [reference group: male]”). For a concrete example, see the one given in the “Multiple Regression” section above.

Statistical Significance

Although coefficients and odds ratios are generated for all explanatory variables used in a multiple or logistic regression analysis, respectively, this report focuses on the interpretation of explanatory variables that yield coefficients or odds ratios that are statistically significant at at least the $p \leq 0.05$ level, as is conventional in most social science research.

Weighting

For all analyses reported, we applied weights unless otherwise noted. This means that we adjusted results so that they are representative of the entire population of WWP Alumni in the Alumnus database, not just those sampled. Weights were based on duty status (active duty versus not active duty), age, and geographic location (based on regions of the Midwest, Northeast, South, and West). For more details on the calculation of weights, see the Westat report (Franklin et al., 2014).

Analyses for Chapter Two, Mental and Physical Health Outcomes

Mental Health Screening Measures

The 2014 WWP Annual Alumni Survey included screening measures for three mental health or substance use disorders: probable depression, PTSD, and problem drinking. No screening measures are available that correctly identify people who meet diagnostic criteria for mental health conditions in all cases. As a result, when using any screening instrument, there is a trade-off between correctly identifying everyone who has the disorder (sensitivity) and correctly identifying those who do not have the disorder (specificity) (Ramchand, Karney, et al., 2008; Prins et al., 2003; Lalkhen and McCluskey, 2008). So, screening positive does not guarantee that someone would meet the criteria for a formal diagnosis of a mental health condition, which would require thorough assessment by a mental health professional. Rather, a positive screen indicates that the person is having symptoms of a mental health disorder and has a greater probability of having the disorder than someone who does not screen positive. Because large-scale surveys preclude the option of having a mental health professional assess each respondent for mental health conditions, screening measures are commonly used to identify the prevalence of disorders by identifying the number of people who screened positive. The three screening measures included in this study and described below have been psychometrically tested and validated and are widely used for assessing the prevalence of the relevant mental health disorder.

The PHQ-8 depression scale (Kroenke et al., 2009) was included in the survey as a screening measure for probable depression. The PHQ-8 requires respondents to endorse the frequency with which they experience eight symptoms of depression (e.g., feeling down, depressed, or hopeless or feeling tired or having little energy); in this study, we designated respondents who met a threshold score of 10 as screening positive for probable depression. Using a cutoff score of 10 or greater yields a sensitivity of 0.88 (Kroenke et al., 2009), indicating that, typically, the PHQ-8 will correctly identify 88 percent of people with formal diagnoses of depression as having probable depression. This means that 12 percent of people who would meet diagnostic criteria for depression would go undetected. The specificity of the PHQ-8 measure is also 0.88 (Kroenke et al., 2009), indicating that, typically, the PHQ-8 correctly identifies 88 percent of the people who complete the instrument and do not meet criteria for a depression diagnosis as not having depression. This means that it would incorrectly identify 12 percent of people who do not meet diagnostic criteria as having probable depression.

The PC-PTSD serves as a screening measure for probable PTSD. The PC-PTSD requires respondents to report whether they have experienced any of four PTSD symptoms (e.g., having nightmares or feeling on guard or watchful); in this study, we considered respondents who reported experiencing three or more of the symptoms to have screened positive for PTSD

(Prins et al., 2003). Using a cutoff of at least three symptoms reported yields a sensitivity of 0.78 and a specificity of 0.87 (Prins et al., 2003).

The alcohol-consumption questions from the Alcohol Use Disorders Identification Test (AUDIT-C) serve as a screening measure for probable problem drinking. These questions ask respondents about the frequency and quantity of drinking, as well as heavy-drinking episodes (Bush et al., 1998). In this study, we considered men and women who met the threshold score for their genders (a score of 4 for men and 3 for women) probable problem drinkers. For men, the threshold score of 4 results in a sensitivity of 0.86 and a specificity of 0.89 (Bradley et al., 2007). For women, the threshold score of 3 yields a sensitivity of 0.73 and a specificity of 0.91 (Bradley et al., 2007).

Receiving Mental Health Care from Any Professional

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of visiting any professional for potential mental health or substance use problems. Table B.2.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.2.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- There are no gender differences.
- Hispanic or Latino Alumni are 1.2 times more likely than white Alumni to receive care.
- Alumni ages 46 to 55 are about 1.3 times more likely than Alumni between the ages of 26 and 30 to receive care.
- There are no differences based on marital status.
- Alumni who reported serving in multiple branches are 1.2 times more likely than those who served only in the Army to have received care.
- Alumni who serve on active duty or are activated National Guard and Reserve are 2.6 and 2.1 times more likely, respectively, to receive care than Alumni who are out of the military.
- There are no differences based on rank.
- Alumni with VA disability ratings of 0 percent, with ratings of 30 to 40 percent, or with no VA disability ratings are less likely to receive care than those with ratings of 10 to 20 percent. Alumni with ratings of 90 to 100 percent are 1.5 times more likely to have received care than those with lower ratings of 10–20 percent.
- Alumni who reported having the following service-related conditions are more likely to have received care from a professional than those who did not report the condition: anxiety (1.5 times), depression (1.8 times), military sexual trauma (1.7 times), PTSD (1.9 times), or a sleep problem (1.2 times). Alumni who screened positive for any probable depression are 1.9 times more likely to have received care than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Similarly, Alumni who screened positive for any probable PTSD are 1.9 times more likely to have received care than those who did not screen positive for that disorder but who screened positive for any probable depression, any probable problem drinking, or both. Alumni reporting having amputation, hearing loss, a knee injury or problem, or

a shrapnel problem are less likely to have received mental health care than those without these conditions. Alumni who screened positive for any probable problem drinking are less likely to have received care than those who did not screen positive but who screened positive for any probable depression, any probable PTSD, or both.

Table B.2.1
Variables Used in Logistic Regression of Receipt of Mental Health Care from Any Professional on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "In the past three months, have you visited any professional, like a doctor, a psychologist, or a counselor, to get help with issues, such as stress, emotional, alcohol, drug, or family problems?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.2.2
Relationship Among Explanatory Variables and Receiving Mental Health Care from Any Professional

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.15	(0.99, 1.34)
Race or ethnicity (reference group: white)		
Black	1.10	(0.95, 1.27)
Hispanic or Latino**	1.21	(1.07, 1.37)
American Indian or Alaska Native	1.02	(0.77, 1.46)
Asian	1.21	(0.88, 1.65)
Native Hawaiian or other Pacific Islander	1.63	(0.91, 2.27)
Other	1.15	(0.85, 1.54)
More than one race or ethnicity selected	1.11	(0.94, 1.31)
Age, in years (reference group: 26–30)		
18–25	1.00	(0.82, 1.23)
31–35	1.03	(0.93, 1.15)
36–40	1.13	(0.99, 1.28)
41–45	1.12	(0.97, 1.29)
46–50**	1.29	(1.10, 1.52)
51–55*	1.30	(1.05, 1.60)
56+	1.34	(1.00, 1.80)

Table B.2.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Marital status (reference group: married)		
Never married	0.90	(0.91, 1.11)
Previously married	1.00	(0.92, 1.13)
Branch of service (reference group: Army)		
Air Force	1.04	(0.88, 1.23)
Marine Corps	0.94	(0.83, 1.05)
Navy or Coast Guard	1.02	(0.87, 1.18)
More than one branch of service*	1.18	(1.00, 1.38)
Service component (reference group: out of the military)		
Active component***	2.60	(2.16, 3.14)
Activated National Guard or Reserve***	2.10	(1.65, 2.66)
National Guard or Reserve (not activated)	1.14	(0.94, 1.30)
Rank (reference group: E-1–E-4)		
E-5–E-9	1.07	(0.97, 1.18)
W-1–W-5	1.05	(0.61, 1.81)
O-1–O-3	0.99	(0.66, 1.49)
O-4–O-6	1.02	(0.57, 1.82)
VA disability rating (reference group: 10–20 percent)		
0**	0.34	(0.16, 0.72)
30–40*	0.75	(0.56, 0.99)
50–60	0.90	(0.69, 1.17)
70–80	1.22	(0.94, 1.57)
90–100**	1.50	(1.16, 1.94)
VA disability rating pending or on appeal	1.26	(0.94, 1.68)
No VA disability rating*	0.60	(0.45, 0.81)
Type of service-related injury or health condition		
Amputation*	0.73	(0.56, 0.96)
Ankle or foot injury	0.96	(0.88, 1.05)
Anxiety***	1.53	(1.36, 1.71)
Back, neck, or shoulder problem	1.02	(0.92, 1.14)
Blindness or severe vision loss	0.96	(0.74, 1.24)
Burn, severe	0.90	(0.70, 1.15)
Depression (self-reported)***	1.79	(1.55, 2.06)

Table B.2.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Fractured bone	0.94	(0.85, 1.05)
Hand injury	0.91	(0.82, 1.01)
Head injury other than TBI	0.95	(0.85, 1.07)
Hearing loss**	0.87	(0.80, 0.96)
Hip injury	1.02	(0.90, 1.14)
Knee injury or problem*	0.91	(0.83, 0.99)
Migraine or other severe headache	1.05	(0.96, 1.15)
Military sexual trauma***	1.70	(1.38, 2.08)
Nerve injury	1.05	(0.96, 1.16)
PTSD (self-reported)***	1.90	(1.67, 2.17)
Shrapnel problem***	0.68	(0.59, 0.78)
Sleep problem*	1.15	(1.02, 1.29)
Spinal-cord injury	1.03	(0.93, 1.16)
TBI	1.10	(1.00, 1.20)
Tinnitus	1.09	(0.99, 1.19)
Other severe physical injury	0.87	(0.71, 1.05)
Other severe mental injury	1.07	(0.88, 1.30)
No physical or mental health injury or health problem ^a	1.10	(0.52, 2.31)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression***	1.93	(1.76, 2.12)
Any probable PTSD***	1.86	(1.65, 2.09)
Any probable problem drinking***	0.76	(0.72, 0.83)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. $n = 15,722$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Receiving Mental Health Care from a Regular Medical Doctor or Primary Care Physician

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of visiting regular medical doctors or primary care physicians about potential mental health or substance use problems. Table B.3.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.3.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- Women are less likely than men to obtain mental health care from regular medical doctors or primary care physicians.
- Alumni of the following races or ethnicities are more likely than white Alumni to receive mental health care from regular medical doctors or primary care physicians: black (1.7 times), Hispanic or Latino (1.6 times), and Asian Alumni (1.7 times).
- Alumni ages 41 to 45 (1.3 times), 46 to 50 (1.3 times), 51 to 55 (1.6 times), and over the age of 55 (2.0 times) are all more likely to obtain care from these types of providers than Alumni ages 26 to 30.
- There are no differences based on marital status.
- Navy or Coast Guard Alumni are 1.3 times more likely than Army Alumni to obtain care from these providers.
- Alumni serving on active duty or who are activated National Guard or Reserve are 2.7 and 4.0 times more likely, respectively, to obtain care from these types of providers than Alumni who are out of the military.
- There are no differences based on rank.
- Alumni with disability ratings of 70 to 80 percent and 90 to 100 percent are 1.5 and 1.8 times more likely than those with ratings of 10 to 20 percent to obtain care from these types of providers.
- Alumni who reported any of the following service-related conditions are more likely than Alumni without those conditions to obtain care from primary care physicians or regular medical doctors: a back, neck, or shoulder problem (1.4 times); blindness or severe vision loss (2.2 times); hip injury (1.3 times); migraine or other severe headache (1.1 times); nerve injury (1.3 times); spinal-cord injury (1.3 times); and TBI (1.3 times). Alumni who screened positive for any probable depression are 1.3 times more likely to obtain care from these providers than Alumni who did not screen positive but who did screen positive for

any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.5 times more likely to obtain care from these providers than Alumni who did not screen positive but who did screen positive for any probable depression, any probable problem drinking, or both. However, Alumni who self-reported having PTSD are less likely to obtain care from these types of providers than those who did not. The reason for conflicting findings for those who self-report having service-related PTSD and those who screened positive for any probable PTSD is not clear. It is possible that some Alumni with service-related PTSD have recovered from the condition and no longer require care, but those with current PTSD symptoms are still receiving care. Alumni who screened positive for any probable problem drinking are less likely to obtain care from primary care physicians or regular medical doctors than Alumni who did not screen positive but who screened positive for any probable depression, any probable PTSD, or both.

Table B.3.1
Variables Used in Logistic Regression of Receipt of Mental Health Care from a Regular Medical Doctor or Primary Care Physician on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "In the past three months, did you visit a regular medical doctor or primary care physician for these problems [such issues as stress, emotional, alcohol, drug, or family problems]?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.3.2
Relationship Among Explanatory Variables and Receiving Mental Health Care from a Regular Medical Doctor or Primary Care Physician

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female*	0.81	(0.66, 0.99)
Race or ethnicity (reference group: white)		
Black***	1.72	(1.34, 2.20)
Hispanic or Latino***	1.60	(1.33, 1.92)
American Indian or Alaska Native	1.06	(0.69, 1.64)
Asian*	1.71	(1.03, 2.84)
Native Hawaiian or other Pacific Islander	0.86	(0.36, 2.07)
Other	1.19	(0.77, 1.85)
More than one race or ethnicity selected	1.21	(0.97, 1.52)
Age, in years (reference group: 26–30)		
18–25	1.14	(0.82, 1.55)
31–35	1.14	(0.97, 1.34)

Table B.3.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
36–40	1.11	(0.92, 1.33)
41–45*	1.31	(1.07, 1.62)
46–50*	1.31	(1.04, 1.65)
51–55**	1.56	(1.14, 2.14)
56+**	2.00	(1.23, 3.14)
Marital status (reference group: married)		
Never married	0.96	(0.77, 1.03)
Previously married	0.89	(0.78, 1.03)
Branch of service (reference group: Army)		
Air Force	1.25	(0.98, 1.59)
Marine Corps	0.92	(0.78, 1.08)
Navy or Coast Guard**	1.34	(1.08, 1.67)
More than one branch of service	0.90	(0.71, 1.14)
Service component (reference group: out of the military)		
Active component***	2.69	(1.99, 3.62)
Activated National Guard or Reserve***	3.95	(2.64, 6.14)
National Guard or Reserve (not activated)	1.21	(0.95, 1.55)
Rank (reference group: E-1–E-4)		
E-5–E-9	0.95	(0.83, 1.07)
W-1–W-5	1.28	(0.51, 3.20)
O-1–O-3	0.90	(0.51, 1.58)
O-4–O-6	1.85	(0.64, 5.34)
VA disability rating (reference group: 10–20 percent)		
0	0.87	(0.28, 2.72)
30–40	1.23	(0.82, 1.83)
50–60	1.41	(0.97, 2.04)
70–80*	1.53	(1.07, 2.18)
90–100**	1.84	(1.29, 2.63)
VA disability rating pending or on appeal	1.26	(0.84, 1.90)
No VA disability rating	0.87	(0.55, 1.36)
Type of service-related injury or health condition		
Amputation	0.72	(0.47, 1.11)
Ankle or foot injury	1.00	(0.88, 1.24)

Table B.3.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Anxiety	1.04	(0.89, 1.24)
Back, neck, or shoulder problem***	1.36	(1.16, 1.58)
Blindness or severe vision loss**	2.17	(1.33, 3.54)
Burn, severe	0.73	(0.49, 1.09)
Depression (self-reported)	0.86	(0.67, 1.09)
Fractured bone	1.10	(0.93, 1.30)
Hand injury	1.15	(0.97, 1.36)
Head injury other than TBI	0.99	(0.82, 1.18)
Hearing loss	1.05	(0.92, 1.20)
Hip injury*	1.26	(1.05, 1.51)
Knee injury or problem	0.97	(0.86, 1.10)
Migraine or other severe headache*	1.12	(0.98, 1.27)
Military sexual trauma	1.18	(0.91, 1.53)
Nerve injury**	1.25	(1.07, 1.44)
PTSD (self-reported)**	0.71	(0.55, 0.90)
Shrapnel problem	0.83	(0.66, 1.04)
Sleep problem	1.09	(0.92, 1.29)
Spinal-cord injury**	1.29	(1.08, 1.55)
TBI***	1.34	(1.17, 1.52)
Tinnitus	0.90	(0.79, 1.03)
Other severe physical injury	1.07	(0.81, 1.41)
Other severe mental injury	1.33	(0.84, 1.87)
No physical or mental health injury or health problem ^a	4.10	(0.45, 37.08)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	1.30	(1.13, 1.51)
Any probable PTSD (positive screen)***	1.46	(1.19, 1.79)
Any probable problem drinking (positive screen)**	0.83	(0.74, 0.94)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. $n = 9,449$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Receiving Mental Health Care from a Mental Health Specialist

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of visiting a mental health specialist for potential mental health or substance use problems. Table B.4.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.4.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- There are no differences based on gender.
- Black Alumni are less likely than white Alumni to have received care from mental health specialists.
- Alumni ages 41 to 45 are 1.4 times more likely than Alumni ages 26 to 30 to have received care from a mental health specialists.
- There are no differences based on marital status.
- There are no differences based on branch of service.
- Alumni who served on active duty or who are activated National Guard or Reserve are 2.0 and 2.2 times more likely, respectively, to have received care from mental health specialists than Alumni who are out of the military.
- There are no differences based on rank.
- There are no differences based on VA disability rating.
- Alumni who reported having service-related anxiety or PTSD are 1.5 and 1.9 more likely than those who did report the condition to have seen mental health specialists. Alumni who screened positive for any probable depression are 1.6 times more likely to have seen mental health specialists than Alumni who did not screen positive but who had screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who had reported having blindness or severe vision loss or “other severe physical injury” are less likely than those who did not to have received care from mental health specialists. Alumni who screened positive for any probable problem drinking are also more likely to have received care from mental health specialists than Alumni who did not screen positive but who did screen positive for any probable depression, any probable PTSD, or both.

Table B.4.1**Variables Used in Logistic Regression of Receipt of Mental Health Care from a Mental Health Specialist on Alumnus Characteristics**

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "In the past three months, did you visit a mental health specialist, like a psychiatrist, psychologist, social worker, or counselor for these problems [issues such as stress, emotional, alcohol, drug, or family problems]?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.4.2**Relationship Among Explanatory Variables and Receiving Mental Health Care from a Mental Health Specialist**

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.28	(0.95, 1.72)
Race or ethnicity (reference group: white)		
Black*	0.73	(0.53, 1.00)
Hispanic or Latino	0.83	(0.65, 1.07)
American Indian or Alaska Native	0.91	(0.49, 1.71)
Asian	0.77	(0.45, 1.32)
Native Hawaiian or other Pacific Islander	1.81	(0.56, 5.87)
Other	1.13	(0.60, 2.13)
More than one race or ethnicity selected	1.18	(0.83, 1.69)
Age, in years (reference group: 26–30)		
18–25	1.10	(0.69, 1.76)
31–35	1.15	(0.91, 1.45)
36–40	1.26	(0.96, 1.67)
41–45*	1.36	(1.01, 1.83)
46–50	1.26	(0.91, 1.75)
51–55	1.12	(0.75, 1.69)
56+	1.19	(0.70, 2.02)
Marital status (reference group: married)		
Never married	1.20	(0.89, 1.62)
Previously married	1.07	(0.87, 1.33)

Table B.4.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Branch of service (reference group: Army)		
Air Force	1.16	(0.80, 1.55)
Marine Corps	0.82	(0.64, 1.04)
Navy or Coast Guard	1.15	(0.81, 1.63)
More than one branch of service	1.15	(0.77, 1.71)
Service component (reference group: out of the military)		
Active component**	2.01	(1.35, 2.98)
Activated National Guard or Reserve**	2.23	(1.35, 3.69)
National Guard or Reserve (not activated)	1.08	(0.76, 1.53)
Rank (reference group: E-1–E-4)		
E-5–E-9	0.92	(0.75, 1.13)
W-1–W-5	0.75	(0.28, 2.06)
O-1–O-3	3.26	(0.75, 14.15)
O-4–O-6	0.47	(0.07, 3.10)
VA disability rating (reference group: 10–20 percent)		
0	1.19	(0.11, 12.47)
30–40	0.86	(0.47, 1.59)
50–60	0.96	(0.54, 1.70)
70–80	1.25	(0.72, 2.17)
90–100	1.58	(0.91, 2.75)
VA disability rating pending or on appeal	1.11	(0.60, 2.07)
No VA disability rating	0.79	(0.42, 1.49)
Type of service-related injury or health condition		
Amputation	0.76	(0.39, 1.44)
Ankle or foot injury	0.84	(0.70, 1.02)
Anxiety**	1.54	(1.20, 1.97)
Back, neck, or shoulder problem	1.00	(0.78, 1.29)
Blindness or severe vision loss*	0.60	(0.38, 0.95)
Burn, severe	0.83	(0.51, 1.33)
Depression (self-reported)	1.29	(0.95, 1.74)
Fractured bone	1.01	(0.81, 1.27)
Hand injury	1.02	(0.80, 1.28)
Head injury other than TBI	1.02	(0.79, 1.31)

Table B.4.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Hearing loss	0.98	(0.80, 1.20)
Hip injury	0.84	(0.66, 1.07)
Knee injury or problem	0.99	(0.82, 1.18)
Migraine or other severe headache	0.92	(0.76, 1.12)
Military sexual trauma	0.89	(0.62, 1.28)
Nerve injury	0.86	(0.70, 1.05)
PTSD (self-reported)***	1.90	(1.41, 2.55)
Shrapnel problem	1.00	(0.73, 1.38)
Sleep problem	1.06	(0.83, 1.39)
Spinal-cord injury	0.84	(0.67, 1.06)
TBI	1.12	(0.91, 1.36)
Tinnitus	1.21	(0.98, 1.48)
Other severe physical injury*	0.61	(0.40, 0.94)
Other severe mental injury	1.05	(0.68, 1.61)
No physical or mental health injury or health problem ^a	1.26	(0.16, 9.92)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	1.58	(1.28, 1.93)
Any probable PTSD (positive screen)	1.23	(0.93, 1.62)
Any probable problem drinking (positive screen)**	0.76	(0.64, 0.90)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. $n = 9,390$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Receipt of Medication for Mental Health Problems

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of being prescribed medication for mental health problems. Table B.5.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.5.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- There are no differences based on gender.
- Alumni who listed race or ethnicity as “other” are less likely than white Alumni to have been prescribed medication for mental health conditions.
- Alumni ages 41 to 45 and 46 to 50 are both 1.4 times more likely to have been prescribed medication for mental health conditions than Alumni who are between 26 and 30.
- Previously married Alumni are less likely than currently married Alumni to have been prescribed medication for mental health conditions.
- Marine Corps Alumni are less likely than Army Alumni to have been prescribed medication for mental health conditions.
- Alumni who served on active duty are 1.4 times more likely than Alumni who are out of the military to have been prescribed medication for mental health conditions.
- There are no differences based on rank.
- Alumni who have VA disability ratings of 70 to 80 percent or 90 to 100 percent are 1.8 and 2.2 times more likely, respectively, to have been prescribed medication for a mental health condition than those with ratings of 10 to 20 percent.
- Alumni who reported having the following service-related conditions are more likely than those without the condition to have been prescribed medication for mental health conditions: anxiety (1.6 times), depression (1.9 times), and PTSD (1.5 times). Alumni who screened positive for any probable depression are 2.0 times more likely to have been prescribed medication than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.6 times more likely to have been prescribed medication for a mental health condition than those who did not but who screened positive for any probable depression, any problem drinking, or both. Alumni who reported having had amputation or fractured bone are less likely to have been prescribed medication for mental health conditions.

Table B.5.1
Variables Used in Logistic Regression of Receipt of Medication for Mental Health Problems on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "In the past three months, have you been prescribed any medication for a mental health or emotional problem?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.5.2
Relationship Among Explanatory Variables and Receipt of Medication for Mental Health Problems

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.20	(0.98, 1.46)
Race or ethnicity (reference group: white)		
Black	0.95	(0.76, 1.19)
Hispanic or Latino	1.04	(0.87, 1.23)
American Indian or Alaska Native	0.90	(0.55, 1.48)
Asian	0.70	(0.45, 1.08)
Native Hawaiian or other Pacific Islander	0.64	(0.32, 1.28)
Other*	0.66	(0.43, 0.99)
More than one race or ethnicity selected	0.93	(0.74, 1.17)
Age, in years (reference group: 26–30)		
18–25	0.93	(0.69, 1.27)
31–35	0.92	(0.78, 1.08)
36–40	1.19	(0.98, 1.45)
41–45**	1.37	(1.10, 1.71)
46–50**	1.43	(1.13, 1.82)
51–55	1.00	(0.75, 1.33)
56+	1.00	(0.63, 1.58)
Marital status (reference group: married)		
Never married	0.94	(0.77, 1.15)
Previously married**	0.81	(0.70, 0.93)
Branch of service (reference group: Army)		
Air Force	1.02	(0.79, 1.32)
Marine Corps**	0.77	(0.65, 0.91)

Table B.5.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Navy or Coast Guard	0.92	(0.73, 1.15)
More than one branch of service	0.99	(0.78, 1.25)
Service component (reference group: out of the military)		
Active component*	1.35	(1.04, 1.76)
Activated National Guard or Reserve	1.34	(0.98, 1.81)
National Guard or Reserve (not activated)	0.83	(0.65, 1.05)
Rank (reference group: E-1–E-4)		
E-5–E-9	1.06	(0.91, 1.22)
W-1–W-5	1.05	(0.51, 2.16)
O-1–O-3	0.88	(0.59, 1.60)
O-4–O-6	0.54	(0.22, 1.29)
VA disability rating (reference group: 10–20 percent)		
0	1.22	(0.35, 4.30)
30–40	1.31	(0.87, 1.98)
50–60	1.40	(0.97, 2.03)
70–80**	1.83	(1.28, 2.61)
90–100***	2.22	(1.55, 3.18)
VA disability rating pending or on appeal	1.43	(0.96, 2.13)
No VA disability rating	0.86	(0.56, 1.32)
Type of service-related injury or health condition		
Amputation*	0.64	(0.43, 0.96)
Ankle or foot injury	0.88	(0.77, 1.00)
Anxiety***	1.55	(1.30, 1.84)
Back, neck, or shoulder problem	0.99	(0.84, 1.18)
Blindness or severe vision loss	0.81	(0.54, 1.20)
Burn, severe	0.91	(0.61, 1.35)
Depression (self-reported)***	1.87	(1.51, 2.32)
Fractured bone*	0.85	(0.72, 1.00)
Hand injury	0.96	(0.82, 1.13)
Head injury other than TBI	0.93	(0.78, 1.10)
Hearing loss	1.04	(0.91, 1.19)
Hip injury	0.87	(0.73, 1.03)
Knee injury or problem	0.95	(0.83, 1.08)

Table B.5.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Migraine or other severe headache	1.13	(0.98, 1.29)
Military sexual trauma	0.81	(0.63, 1.05)
Nerve injury	0.92	(0.80, 1.07)
PTSD (self-reported)***	1.54	(1.24, 1.91)
Shrapnel problem	1.18	(0.95, 1.48)
Sleep problem	1.09	(0.90, 1.30)
Spinal-cord injury	1.13	(0.96, 1.34)
TBI	1.01	(0.88, 1.16)
Tinnitus	0.90	(0.78, 1.03)
Other severe physical injury	1.01	(0.74, 1.36)
Other severe mental injury	1.12	(0.82, 1.52)
No physical or mental health injury or health problem ^a	4.02	(0.61, 26.60)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	1.96	(1.70, 2.26)
Any probable PTSD (positive screen)***	1.55	(1.27, 1.88)
Any probable problem drinking (positive screen)	0.96	(0.85, 1.08)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. n = 9,427.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Receipt of Counseling for Mental Health Problems

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of receiving counseling for mental health problems. Table B.6.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.6.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- Female Alumni are 1.3 times more likely than male Alumni to receive counseling for mental health problems.
- Alumni who reported their race or ethnicity as “other” are 1.7 times more likely than white Alumni to receive counseling for mental health problems.
- Alumni in the following age categories are more likely to receive counseling for mental health problems than those ages 26 to 30: ages 31 to 35 (1.3 times), 36 to 40 (1.4 times), 41 to 45 (1.3 times), and 46 to 50 (1.5 times).
- There are no differences based on marital status.
- There are no differences based on branch of service.
- Alumni serving on active duty or who are activated National Guard or Reserve are 2.2 and 1.9 times more likely than those who are out of the military to receive counseling for mental health problems.
- There are no differences based on rank.
- There are no differences based on VA disability rating.
- Alumni who reported having the following service-related conditions are more likely to receive counseling for mental health problems than those who did not report the condition: anxiety (1.3 times), depression (1.5 times), and PTSD (1.5 times). Alumni who screened positive for any probable depression are 1.3 times more likely to receive counseling for mental health problems than Alumni who did not screen positive but who screened positive for any probable PTSD, any probable problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.5 times more likely to receive counseling for mental health problems than Alumni who did not screen positive but who screened positive for any probable depression, any probable problem drinking, or both.

Table B.6.1
Variables Used in Logistic Regression of Receipt of Counseling for Mental Health Problems on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "In the past three months, have you received counseling, either individual, family, or group counseling, for a mental health or emotional problem?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.6.2
Relationship Among Explanatory Variables and Receipt of Counseling for Mental Health Problems

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female*	1.26	(1.03, 1.55)
Race or ethnicity (reference group: white)		
Black	1.09	(0.88, 1.35)
Hispanic or Latino	0.93	(0.79, 1.10)
American Indian or Alaska Native	1.13	(0.72, 1.77)
Asian	1.00	(0.65, 1.55)
Native Hawaiian or other Pacific Islander	0.89	(0.41, 1.94)
Other*	1.71	(1.05, 2.80)
More than one race or ethnicity selected	1.06	(0.86, 1.32)
Age, in years (reference group: 26–30)		
18–25	0.90	(0.67, 1.20)
31–35**	1.27	(1.09, 1.48)
36–40**	1.38	(1.15, 1.65)
41–45*	1.27	(1.04, 1.56)
46–50***	1.50	(1.20, 1.87)
51–55	1.13	(0.86, 1.49)
56+	1.47	(0.99, 2.20)
Marital status (reference group: married)		
Never married	1.02	(0.84, 1.24)
Previously married	0.96	(0.84, 1.11)
Branch of service (reference group: Army)		
Air Force	1.27	(0.99, 1.62)
Marine Corps	1.01	(0.86, 1.19)

Table B.6.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Navy or Coast Guard	1.10	(0.89, 1.36)
More than one branch of service	1.14	(0.90, 1.44)
Service component (reference group: out of the military)		
Active component***	2.23	(1.69, 2.94)
Activated National Guard or Reserve***	1.85	(1.31, 2.59)
National Guard or Reserve (not activated)	0.90	(0.71, 1.14)
Rank (reference group: E-1–E-4)		
E-5–E-9	1.06	(0.92, 1.21)
W-1–W-5	2.07	(0.88, 4.88)
O-1–O-3	1.30	(0.69, 2.43)
O-4–O-6	2.69	(0.87, 8.28)
VA disability rating (reference group: 10–20 percent)		
0	0.48	(0.12, 1.95)
30–40	0.76	(0.49, 1.20)
50–60	0.76	(0.50, 1.15)
70–80	0.90	(0.60, 1.34)
90–100	1.02	(0.69, 1.53)
VA disability rating pending or on appeal	0.92	(0.59, 1.43)
No VA disability rating	0.68	(0.42, 1.09)
Type of service-related injury or health condition		
Amputation	0.91	(0.62, 1.36)
Ankle or foot injury	0.93	(0.82, 1.06)
Anxiety**	1.30	(1.10, 1.53)
Back, neck, or shoulder problem	1.02	(0.86, 1.12)
Blindness or severe vision loss	1.07	(0.73, 1.58)
Burn, severe	0.74	(0.52, 1.06)
Depression (self-reported)***	1.50	(1.21, 1.87)
Fractured bone	1.00	(0.85, 1.16)
Hand injury	0.92	(0.79, 1.07)
Head injury other than TBI	0.93	(0.79, 1.09)
Hearing loss	0.98	(0.86, 1.12)
Hip injury	0.94	(0.80, 1.11)
Knee injury or problem	0.99	(0.88, 1.12)

Table B.6.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Migraine or other severe headache	1.06	(0.93, 1.20)
Military sexual trauma	1.14	(0.87, 1.48)
Nerve injury	0.88	(0.77, 1.00)
PTSD (self-reported)***	1.47	(1.19, 1.81)
Shrapnel problem	1.00	(0.81, 1.24)
Sleep problem	0.99	(0.83, 1.18)
Spinal-cord injury	1.05	(0.89, 1.22)
TBI	1.05	(0.92, 1.19)
Tinnitus	1.12	(0.98, 1.27)
Other severe physical injury	0.76	(0.58, 1.01)
Other severe mental injury	0.79	(0.57, 1.09)
No physical or mental health injury or health problem ^a	0.23	(0.05, 1.10)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	1.34	(1.15, 1.54)
Any probable PTSD (positive screen)***	1.53	(1.26, 1.84)
Any probable problem drinking (positive screen)	0.92	(0.82, 1.04)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. $n = 9,444$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Having Difficulty, Putting Off, or Not Getting Mental Health Care

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of difficulty, delays, or not getting mental health care. Table B.7.1 lists variables used in the analysis. To focus on the Alumni most in need of mental health care, for this analysis, we restricted the sample to Alumni who screened positive for any probable depression, any probable PTSD, or any probable problem drinking.

Table B.7.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among Alumni who screened positive for any probable depression, PTSD, or problem drinking, the following are true:

- Female Alumni are 1.5 times more likely than male Alumni to report having difficulty, putting off, or not getting mental health care.
- Black and Hispanic or Latino Alumni are less likely than white Alumni to report having difficulty, putting off, or not getting mental health care.
- Alumni ages 41 and up are less likely than Alumni ages 26 to 30 to report having difficulty, putting off, or not getting mental health care.
- Previously married Alumni are 1.1 times more likely than currently married Alumni to report having difficulty, putting off, or not getting mental health care.
- There are no differences based on branch of service.
- Alumni serving on active duty or who are activated National Guard or Reserve are less likely than Alumni who are out of the military to report having difficulty, putting off, or not getting mental health care.
- There are no differences based on rank.
- There are no differences based on VA disability rating.
- Alumni who reported having the following service-related conditions are more likely than Alumni not reporting the condition to report having difficulty, putting off, or not getting mental health care: depression (1.6 times), hand injury (1.2 times), migraine or other severe headache (1.1 times), and PTSD (1.6 times). Alumni who screened positive for any probable depression are 2.2 times more likely to report difficulty, putting off, or not getting care than Alumni who did not screen positive but who did screen positive for any probable PTSD, any problem drinking, or both. Alumni who screened positive for any probable PTSD are 1.8 times more likely to report having difficulty, putting off, or not getting mental health care than those not screening positive but who screened positive for any probable depression, any probable problem drinking, or both. Alumni who screened positive for any probable problem drinking are 1.3 times more likely to report having difficulty, putting off, or not getting mental health care than those who did not but who

screened positive for any probable depression, any probable problem drinking, or both. Alumni reporting service-related tinnitus are less likely than those who did not report tinnitus to report having difficulty, putting off, or not getting mental health care.

Table B.7.1
Variables Used in Logistic Regression of Having Difficulty, Putting Off, or Not Getting Mental Health Care on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "During the <i>past 12 months</i> , were there any times when you had difficulty getting <i>mental health</i> care, or you put off getting care or you did not get the mental health care you thought you needed?" "Yes" response coded as a 1. "No" response coded as a 0.

Table B.7.2
Relationship Among Explanatory Variables and Having Difficulty, Putting Off, or Not Getting Mental Health Care on Alumnus Characteristics

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female***	1.46	(1.27, 1.67)
Race or ethnicity (reference group: white)		
Black***	0.75	(0.65, 0.88)
Hispanic or Latino*	0.87	(0.77, 0.97)
American Indian or Alaska Native	0.79	(0.58, 1.06)
Asian	1.08	(0.82, 1.43)
Native Hawaiian or other Pacific Islander	1.50	(0.95, 2.37)
Other	1.06	(0.81, 1.40)
More than one race or ethnicity selected	1.12	(0.97, 1.30)
Age, in years (reference group: 26–30)		
18–25	0.95	(0.78, 1.16)
31–35	0.98	(0.89, 1.09)
36–40	0.89	(0.79, 1.00)
41–45***	0.76	(0.66, 0.87)
46–50***	0.72	(0.61, 0.84)
51–55***	0.52	(0.42, 0.64)
56+***	0.43	(0.32, 0.57)
Marital status (reference group: married)		
Never married	0.97	(0.86, 1.10)
Previously married*	1.13	(1.03, 1.24)

Table B.7.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Branch of service (reference group: Army)		
Air Force	1.05	(0.89, 1.22)
Marine Corps	0.94	(0.84, 1.04)
Navy or Coast Guard	1.15	(0.99, 1.32)
More than one branch of service	0.97	(0.83, 1.13)
Service component (reference group: out of the military)		
Active component***	0.58	(0.48, 0.69)
Activated National Guard or Reserve***	0.54	(0.43, 0.69)
National Guard or Reserve (not activated)	0.96	(0.82, 1.13)
Rank (reference group: E-1–E-4)		
E-5–E-9	0.97	(0.89, 1.07)
W-1–W-5	1.03	(0.59, 1.79)
O-1–O-3	0.84	(0.57, 1.24)
O-4–O-6	1.20	(0.61, 2.37)
VA disability rating (reference group: 10–20 percent)		
0	1.20	(0.59, 2.43)
30–40	1.11	(0.84, 1.45)
50–60	0.99	(0.77, 1.28)
70–80	1.11	(0.86, 1.42)
90–100	0.89	(0.69, 1.15)
VA disability rating pending or on appeal	1.15	(0.87, 1.52)
No VA disability rating	1.26	(0.95, 1.69)
Type of service-related injury or health condition		
Amputation	0.77	(0.58, 1.02)
Ankle or foot injury	1.07	(0.98, 1.16)
Anxiety	1.03	(0.92, 1.16)
Back, neck, or shoulder problem	1.04	(0.93, 1.15)
Blindness or severe vision loss	1.17	(0.91, 1.52)
Burn, severe	0.91	(0.70, 1.17)
Depression (self-reported)***	1.59	(1.38, 1.83)
Fractured bone	1.04	(0.94, 1.15)
Hand injury**	1.17	(1.06, 1.30)
Head injury other than TBI	1.01	(0.91, 1.12)

Table B.7.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Hearing loss	1.08	(0.99, 1.18)
Hip injury	1.01	(0.91, 1.13)
Knee injury or problem	0.98	(0.90, 1.06)
Migraine or other severe headache**	1.12	(1.03, 1.23)
Military sexual trauma	1.15	(0.96, 1.37)
Nerve injury	0.96	(0.88, 1.05)
PTSD (self-reported)***	1.59	(1.38, 1.83)
Shrapnel problem	0.88	(0.77, 1.01)
Sleep problem	1.10	(0.98, 1.23)
Spinal-cord injury	1.03	(0.93, 1.14)
TBI	1.04	(0.95, 1.14)
Tinnitus*	0.91	(0.83, 1.00)
Other severe physical injury	0.86	(0.71, 1.04)
Other severe mental injury	1.34	(0.96, 1.45)
No physical or mental health injury or health problem ^a	1.25	(0.60, 2.98)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	2.21	(2.00, 2.43)
Any probable PTSD (positive screen)***	1.79	(1.58, 2.03)
Any probable problem drinking (positive screen)***	1.26	(1.16, 1.36)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Sample restricted to Alumni screening positive for any probable depression, PTSD, or problem drinking. $n = 15,578$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

General Self-Reported Health

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus general self-reported health status. Table B.8.1 lists variables used in the analysis.

Table B.8.2 provides the weighted odds ratios associated with each explanatory variable. The results show that, among all Alumni, the following are true:

- There are no gender differences in general self-reported health.
- Alumni who identified as Hispanic or Latino or as black are 1.2 and 1.4 times more likely, respectively, than white Alumni to report fair or poor health.
- Alumni over the age of 35 are more likely than those ages 26 to 30 to report fair or poor health status. For example, 36- to 40-year-old Alumni are 1.3 times as likely to report fair or poor health as 26- to 30-year-old Alumni, and Alumni 51 or older are 2.0 times as likely.
- Never-married Alumni are less likely than married Alumni to report fair or poor health.
- Marine Corps Alumni are less likely to report fair or poor health than Alumni who served in the Army.
- Active-component service members are 1.2 times more likely than Alumni who are out of the military to report fair or poor health.
- Alumni whose highest rank was E-5 to E-9 or W-1 to W-5 are less likely than E-1 to E-4 Alumni to report fair or poor health status.
- Alumni with VA disability ratings of 30 percent or greater are more likely to report fair or poor health status than those with ratings of 10 to 20 percent. For example, Alumni with VA disability ratings of 30 to 40 percent are 1.4 times more likely to report fair or poor health than Alumni with ratings of 10 to 20 percent, and those with ratings of 90 to 100 percent are 2.2 times more likely. Alumni with VA disability ratings pending or on appeal are 2.0 times more likely to report fair or poor health.
- Alumni reporting the following service-related injuries are more likely than those who did not report the injury to report being in fair or poor health: ankle or foot injury (1.1 times); back, neck, or shoulder problem (1.3 times); depression (1.4 times); hip injury (1.2 times); migraine or other severe headache (1.3 times); nerve injury (1.3 times); sleep problem (1.2 times); or spinal-cord injury (1.6 times). Alumni who screened positive for any probable depression are 3.3 times more likely than those who did not screen positive to report fair or poor health. Alumni screening positive for any probable PTSD are 1.4 times more likely than those who did not screen positive to report fair or poor health. Alumni reporting having amputation, burns, or shrapnel problem are less likely to report

being in fair or poor health than those not reporting those injuries. Alumni who had screened positive for any probable problem drinking are also less likely to report fair or poor health than those who did not screen positive.

- Increased BMI is associated with a greater likelihood of reporting fair or poor health.

Table B.8.1
Variables Used in Logistic Regression of General Self-Reported Health on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A; BMI
Outcome variable	Survey item: "In general, would you say your health is . . ." Response coded as a 1 if "fair" or "poor" was selected. Response coded as a 0 if "excellent," "very good," or "good" was selected.

Table B.8.2
Relationship Among Explanatory Variables and General Self-Reported Fair or Poor Health

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.02	(0.88, 1.16)
Race or ethnicity (reference group: white)		
Black***	1.39	(1.21, 1.60)
Hispanic or Latino**	1.21	(1.07, 1.36)
American Indian or Alaska Native	1.35	(0.97, 1.88)
Asian	1.17	(0.87, 1.56)
Native Hawaiian or other Pacific Islander	1.50	(0.96, 2.35)
Other	1.28	(0.95, 1.73)
More than one race or ethnicity selected	1.03	(0.88, 1.21)
Age, in years (reference group: 26–30)		
18–25	1.04	(0.86, 1.25)
31–35	1.02	(0.92, 1.13)
36–40***	1.28	(1.13, 1.44)
41–45***	1.36	(1.19, 1.56)
46–50***	1.81	(1.55, 2.11)
51–55***	2.03	(1.66, 2.49)
56+***	2.00	(1.54, 2.60)
Marital status (reference group: married)		
Never married*	0.88	(0.77, 0.99)
Previously married	1.01	(0.92, 1.11)

Table B.8.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Branch of service (reference group: Army)		
Air Force	0.95	(0.81, 1.12)
Marine Corps*	0.89	(0.79, 0.99)
Navy or Coast Guard	0.97	(0.81, 1.11)
More than one branch of service	1.01	(0.87, 1.17)
Service component (reference group: out of the military)		
Active component*	1.22	(1.03, 1.46)
Activated National Guard or Reserve	1.20	(0.98, 1.48)
National Guard or Reserve (not activated)	0.92	(0.80, 1.07)
Rank (reference group: E-1–E-4)		
E-5–E-9*	0.91	(0.83, 0.99)
W-1–W-5*	0.59	(0.37, 0.94)
O-1–O-3	0.73	(0.50, 1.06)
O-4–O-6	0.92	(0.55, 1.54)
VA disability rating (reference group: 10–20 percent)		
0	0.99	(0.48, 2.06)
30–40*	1.36	(1.08, 1.73)
50–60***	1.52	(1.21, 1.90)
70–80***	1.67	(1.34, 2.07)
90–100***	2.15	(1.72, 2.68)
VA disability rating pending or on appeal**	2.00	(1.57, 2.56)
No VA disability rating	1.01	(0.78, 1.30)
Type of service-related injury or health condition		
Amputation***	0.52	(0.40, 0.69)
Ankle or foot injury*	1.11	(1.02, 1.21)
Anxiety	1.09	(0.97, 1.22)
Back, neck, or shoulder problem***	1.34	(1.21, 1.49)
Blindness or severe vision loss**	1.04	(0.80, 1.35)
Burn, severe**	0.67	(0.62, 0.86)
Depression (self-reported)***	1.35	(1.18, 1.55)
Fractured bone	0.92	(0.83, 1.02)
Hand injury	1.06	(0.95, 1.18)
Head injury other than TBI	0.93	(0.83, 1.04)

Table B.8.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Hearing loss	0.98	(0.90, 1.07)
Hip injury**	1.17	(1.04, 1.32)
Knee injury or problem	1.08	(0.99, 1.17)
Migraine or other severe headache***	1.30	(1.20, 1.42)
Military sexual trauma	1.09	(0.91, 1.32)
Nerve injury***	1.27	(1.15, 1.39)
PTSD (self-reported)	0.90	(0.79, 1.01)
Shrapnel problem**	0.82	(0.71, 0.95)
Sleep problem**	1.20	(1.08, 1.34)
Spinal-cord injury**	1.58	(1.40, 1.77)
TBI	1.09	(0.99, 1.19)
Tinnitus	0.95	(0.86, 1.04)
Other severe physical injury	1.02	(0.86, 1.22)
Other severe mental injury	0.92	(0.76, 1.12)
No physical or mental health injury or health problem ^a	1.23	(0.73, 2.07)
BMI***	1.04	(1.04, 1.05)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	3.30	(3.02, 3.61)
Any probable PTSD (positive screen)***	1.40	(1.26, 1.56)
Any probable problem drinking (positive screen)***	0.86	(0.80, 0.93)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,405$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Limitations Caused by Physical Health

This appendix details a regression analysis exploring Alumnus characteristics and their associations with scores on a measure that assesses limitations in daily activities caused by physical health. Table B.9.1 lists variables used in the analysis.

Table B.9.2 provides the weighted multiple regression coefficients associated with each explanatory variable. The results show that there is some variation in physical-limitation scores based on respondent characteristics. However, the magnitude of the regression coefficients is small and, in most cases, less than three points on the 100-point scale; three points is considered to be a clinically important difference on the scale (Samsa et al., 1999). Given these results, most respondent characteristics are not meaningfully associated with differential levels of physical limitations. Respondent characteristics associated with changes of three points or greater on the scale are as follows:

- Alumni who are 51 to 55 years old reported decreases of 3.1 points on the scale, and Alumni over the age of 55 reported decreases of 4.7 points.
- Physical limitations increase as VA disability rating increases, with each increasing VA disability rating group reporting more limitations than the 10- to 20-percent VA disability rating reference group. Alumni with ratings of 90 to 100 percent reported decreases of four points on the scale.
- Alumni who screened positive for any probable depression show decreases of 5.9 points relative to those who did not screen positive.

Table B.9.1
Variables Used in Regression of Limitations Caused by Physical Health on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A; BMI
Outcome variable	Survey questions: Four questions about the extent to which physical health has interfered with work or activities (e.g., "cut down the amount of time you spent on work or other activities?") "Yes" responses are coded as 0, and "no" responses are coded as 100. The total score is the average of these responses, resulting in a range from 0 to 100, with 0 indicating greater limitations to daily activity caused by physical health and 100 indicating no limitations to daily activity caused by physical health.

Table B.9.2
Relationship Among Explanatory Variables and Limitations Caused by Physical Health

Explanatory Variable	Regression Coefficient	Standard Error
Gender (reference group: male)		
Female**	-1.07	0.34
Race or ethnicity (reference group: white)		
Black	-0.25	0.33
Hispanic or Latino	0.18	0.29
American Indian or Alaska Native	-1.37	0.73
Asian	-0.75	0.78
Native Hawaiian or other Pacific Islander	-1.74	0.89
Other	-0.18	0.70
More than one race or ethnicity selected	-0.69	0.37
Age, in years (reference group: 26–30)		
18–25	-0.05	0.47
31–35	-0.45	0.26
36–40***	-1.24	0.30
41–45***	-1.50	0.33
46–50***	-2.44	0.36
51–55***	-3.14	0.44
56+***	-4.73	0.60
Marital status (reference group: married)		
Never married***	1.33	0.31
Previously married*	0.60	0.24
Branch of service (reference group: Army)		
Air Force*	-0.87	0.39
Marine Corps***	1.14	0.28
Navy or Coast Guard	0.30	0.34
More than one branch of service	0.36	0.35
Service component (reference group: out of the military)		
Active component***	-2.49	0.38
Activated National Guard or Reserve***	-2.13	0.49
National Guard or Reserve (not activated)	0.67	0.36
Rank (reference group: E-1–E-4)		
E-5–E-9	0.22	0.23
W-1–W-5	0.81	1.11

Table B.9.2—Continued

Explanatory Variable	Regression Coefficient	Standard Error
O-1–O-3	-0.55	0.81
O-4–O-6	0.14	0.94
VA disability rating (reference group: 10–20 percent)		
0	2.13	1.30
30–40	-0.94	0.58
50–60*	-1.20	0.55
70–80***	-2.40	0.54
90–100***	-4.00	0.54
VA disability rating pending or on appeal***	-2.79	0.60
No VA disability rating*	1.51	0.60
Type of service-related injury or health condition		
Amputation	0.39	0.66
Ankle or foot injury*	-0.42	0.21
Anxiety	0.31	0.29
Back, neck, or shoulder problem***	-2.82	0.27
Blindness or severe vision loss	-0.23	0.63
Burn, severe	-0.03	0.54
Depression (self-reported)*	-0.81	0.36
Fractured bone	-0.06	0.25
Hand injury	-0.15	0.24
Head injury other than TBI	0.11	0.27
Hearing loss*	0.49	0.22
Hip injury***	-0.99	0.28
Knee injury or problem***	-0.80	0.20
Migraine or other severe headache***	-1.17	0.22
Military sexual trauma	-0.23	0.44
Nerve injury***	-2.48	0.22
PTSD (self-reported)***	1.38	0.29
Shrapnel problem**	0.97	0.32
Sleep problem***	-1.18	0.27
Spinal-cord injury***	-2.45	0.25
TBI***	-0.82	0.22
Tinnitus	-0.16	0.22

Table B.9.2—Continued

Explanatory Variable	Regression Coefficient	Standard Error
Other severe physical injury	-0.31	0.44
Other severe mental injury	-0.30	0.48
BMI*	-0.04	0.02
No physical or mental health injury or health problem ^a	-1.87	1.16
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	-5.87	0.24
Any probable PTSD (positive screen)***	-2.81	0.28
Any probable problem drinking (positive screen)***	0.98	0.19

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,119$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Alumnus Characteristics and Exercise Frequency

This appendix details a regression analysis exploring Alumnus characteristics and exercise frequency. Table B.10.1 lists variables used in the analysis.

Table B.10.2 provides the weighted multiple regression coefficients associated with each explanatory variable. However, the magnitude of the regression coefficients in most cases is small on the 0-to-7 scale, suggesting that many characteristics are not related to exercise frequency in substantial ways. The results show that, among all Alumni, the following were observed:

- Women exercised 0.2 fewer days than men per week.
- Hispanic or Latino Alumni exercised 0.2 days more per week than white Alumni.
- Alumni between the ages of 18 and 25 exercised 0.2 days per week more than 26- to 30-year-old Alumni. However, Alumni ages 36 and up exercised fewer days per week than 26- to 30-year-old Alumni. For example, Alumni ages 36 to 40 exercised 0.3 fewer days, and Alumni ages 51 to 55 exercised 0.6 fewer days.
- Never-married and previously married Alumni exercised 0.2 and 0.1 more days per week, respectively, than married Alumni.
- Alumni who served in the Air Force exercised about 0.2 days less than Army Alumni. Marine Corps Alumni exercised about 0.2 days more than Army Alumni.
- Active-component Alumni exercised nearly one more day a week than Alumni who are out of the military. Activated and nonactivated National Guard or Reserve exercised 0.5 and 0.2 more days per week, respectively, than Alumni out of the military.
- Alumni who had ranks of E-5 to E-9 exercised 0.1 more days per week than Alumni who were E-1 to E-4. Warrant officers exercised 0.7 more days per week than Alumni who were E-1 to E-4.
- Alumni with no VA disability rating exercised 0.6 days more than Alumni with ratings of 10 to 20 percent.
- Alumni who reported the following service-related conditions exercised fewer days per week than Alumni who did not report those conditions: back, neck, or shoulder injury (0.1 days); depression (0.2 days); or spinal-cord injury (0.1 days). Alumni who screened positive for any probable depression exercised, on average, 0.8 fewer days per week than those who did not screen positive. Alumni reporting the following service-related conditions exercised more days per week than Alumni who did not report those conditions: head injury other than TBI (0.1 days), military sexual trauma (0.2 days), or TBI (0.2 days).
- Higher BMI was associated with a slightly lower frequency of exercising.

Table B.10.1
Variables Used in a Regression of Exercise Frequency on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A; BMI
Outcome variable	Survey question: "In a typical week, how many days do you do any moderate-intensity physical activity or exercise, such as a brisk walk, jog, cycle, play adapted sports, swim . . . ?" Responses of "less than once a week" were coded as a 0. Responses of one through seven times per week were coded as that number (e.g., three days per week would be coded as a 3).

Table B.10.2
Relationship Among Explanatory Variables and Exercise Frequency

Explanatory Variable	Regression Coefficient	Standard Error
Gender (reference group: male)		
Female**	-0.18	0.06
Race or ethnicity (reference group: white)		
Black	0.09	0.06
Hispanic or Latino**	0.15	0.05
American Indian or Alaska Native	0.17	0.13
Asian	0.08	0.11
Native Hawaiian or other Pacific Islander	0.15	0.22
Other	0.15	0.12
More than one race or ethnicity selected	0.08	0.07
Age, in years (reference group: 26–30)		
18–25*	0.17	0.09
31–35*	-0.10	0.05
36–40***	-0.27	0.05
41–45***	-0.40	0.06
46–50***	-0.45	0.06
51–55***	-0.55	0.08
56+**	-0.38	0.11
Marital status (reference group: married)		
Never married***	0.23	0.06
Previously married**	0.14	0.04
Branch of service (reference group: Army)		
Air Force**	-0.18	0.07
Marine Corps**	0.17	0.05

Table B.10.2—Continued

Explanatory Variable	Regression Coefficient	Standard Error
Navy or Coast Guard	0.03	0.06
More than one branch of service	0.00	0.06
Service component (reference group: out of the military)		
Active component***	0.83	0.07
Activated National Guard or Reserve***	0.47	0.09
National Guard or Reserve (not activated) ***	0.23	0.06
Rank (reference group: E-1–E-4)		
E-5–E-9**	0.11	0.04
W-1–W-5***	0.69	0.18
O-1–O-3	0.16	0.16
O-4–O-6	0.20	0.20
VA disability rating (reference group: 10–20 percent)		
0	0.25	0.27
30–40	0.06	0.11
50–60	-0.04	0.10
70–80	-0.05	0.10
90–100	-0.15	0.10
VA disability rating pending or on appeal	-0.10	0.11
No VA disability rating***	0.57	0.11
Type of service-related injury or health condition		
Amputation	0.02	0.11
Ankle or foot injury	-0.03	0.04
Anxiety	-0.01	0.05
Back, neck, or shoulder problem**	-0.14	0.05
Blindness or severe vision loss	0.09	0.12
Burn, severe	0.17	0.11
Depression (self-reported)***	-0.22	0.06
Fractured bone	-0.01	0.05
Hand injury	-0.04	0.04
Head injury other than TBI**	0.14	0.05
Hearing loss	0.07	0.04
Hip injury	0.07	0.05
Knee injury or problem	-0.03	0.04

Table B.10.2—Continued

Explanatory Variable	Regression Coefficient	Standard Error
Migraine or other severe headache	-0.05	0.04
Military sexual trauma*	0.18	0.08
Nerve injury	-0.04	0.04
PTSD (self-reported)	0.07	0.05
Shrapnel problem	0.08	0.06
Sleep problem	-0.04	0.05
Spinal-cord injury*	-0.11	0.05
TBI***	0.15	0.04
Tinnitus	-0.05	0.04
Other severe physical injury	0.01	0.08
Other severe mental injury	0.05	0.08
BMI**	-0.04	0.00
No physical or mental health injury or health problem ^a	-0.25	0.22
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	-0.79	0.04
Any probable PTSD (positive screen)	-0.03	0.05
Any probable problem drinking (positive screen)	0.04	0.03

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,366$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Alumnus Characteristics and Limitations on Doing Vigorous Activity

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of being limited in doing vigorous activity. Table B.11.1 lists variables used in the analysis.

Table B.11.2 provides the weighted odds ratios associated with each explanatory variable. The results show the following:

- Women are 1.6 times more likely than men to report that their health limits their ability to participate in vigorous activities “a lot.”
- Alumni who reported being Asian or Hispanic or Latino or who selected “other” for race or ethnicity are less likely than white Alumni to feel limited.
- Alumni ages 18 to 25 are 1.2 times more likely than 26- to 30-year-olds to report being limited a lot. From age 36 onward, Alumnus reports of being limited a lot increased with Alumnus age. For example, 36- to 40-year-old Alumni are 1.3 times as likely as 26- to 30-year-olds to report being limited, and Alumni age 56 or older are 2.0 times more likely.
- Married Alumni are more likely than never-married and previously married Alumni to report that their health limits their ability to participate in vigorous activities.
- Navy or Coast Guard and Marine Corps Alumni are less likely than Army Alumni to report feeling limited.
- Active-component Alumni are 1.9 times more likely and activated National Guard or Reserve 1.6 times more likely than Alumni who are out of the military to report limitations. National Guard or Reserve Alumni who are not activated are less likely than Alumni out of the military to report limitations.
- Alumni with pay grades of E-5 to E-9 and O-1 to O-4 are less likely to feel limited in performing vigorous activity than E-1-to-E-4 Alumni.
- Alumni with VA disability ratings of 30 percent or greater are more likely to report limitations than those with ratings of 10 to 20 percent. For example, Alumni with ratings of 30 to 40 percent are 1.6 times more likely, and Alumni with ratings of 90 to 100 percent are 3.3 times more likely. Alumni with VA disability ratings pending or on appeal are 2.2 times more likely to report limitations than those with ratings of 10 to 20 percent.
- Alumni reporting the following service-related conditions are more likely to report limitations in performing vigorous activities than those without the condition: amputation (1.3 times); ankle or foot injury (1.3 times); back, neck, or shoulder problem (1.6. times); fractured bone (1.2 times); hip injury (1.4 times); knee injury or problem (1.4 times);

migraine or other severe headache (1.2 times); nerve injury (1.8 times); sleep problem (1.3 times); or spinal-cord injury (2.1 times). Alumni who screened positive for any probable depression are 2.5 times more likely to report greater limitations than those who did not screen positive. Alumni who screened positive for any probable PTSD are 1.2 times more likely to report greater limitations than those who did not screen positive. Alumni self-reporting the following service-related conditions are less likely to report feeling limited in vigorous activity than Alumni without the condition: hand injury, hearing loss, PTSD, or shrapnel problem. Alumni who screened positive for any probable problem drinking are less likely to report being limited than those who did not. It is unclear why those who self-reported having PTSD and those who screened positive for any probable PTSD show conflicting reports of limitations. It is possible that some Alumni who were diagnosed with PTSD related to their service had recovered and faced fewer limitations than Alumni who are currently experiencing symptoms of PTSD and accompanying limitations.

Table B.11.1
Variables Used in Logistic Regression of Limitations of Doing Vigorous Activity on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey item: Response to the question, "Does your health now limit you in these activities? If so, how much?" in reference to "vigorous activities, such as running, lifting heavy objects, [and] participating in strenuous sports." Response coded as a 1 if respondent selected "Yes, limited a lot." Response coded as a 0 if respondent selected "Yes, limited a little" or "No, not limited at all."

Table B.11.2
Relationship Among Explanatory Variables and Reporting Being "Limited a Lot" in Vigorous Activities

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female***	1.58	(1.38, 1.81)
Race or ethnicity (reference group: white)		
Black or African-American	0.89	(0.77, 1.02)
Hispanic or Latino***	0.78	(0.69, 0.87)
American Indian or Alaska Native	0.92	(0.67, 1.25)
Asian*	0.70	(0.52, 0.93)
Native Hawaiian or other Pacific Islander	0.96	(0.56, 1.67)
Other*	0.76	(0.57, 1.00)
More than one race or ethnicity selected	1.04	(0.89, 1.21)

Table B.11.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Age, in years (reference group: 26–30)		
18–25*	1.22	(1.02, 1.47)
31–35	0.96	(0.87, 1.06)
36–40***	1.26	(1.12, 1.43)
41–45***	1.55	(1.36, 1.78)
46–50***	1.70	(1.46, 1.98)
51–55***	1.92	(1.56, 2.35)
56+***	2.00	(1.52, 2.62)
Marital status (reference group: married)		
Never married***	0.64	(0.56, 0.72)
Previously married***	0.75	(0.68, 0.82)
Branch of service (reference group: Army)		
Air Force	0.94	(0.80, 1.10)
Marine Corps***	0.62	(0.55, 0.69)
Navy or Coast Guard**	0.81	(0.70, 0.92)
More than one branch of service	0.94	(0.81, 1.09)
Service component (reference group: out of the military)		
Active component***	1.88	(1.57, 2.23)
Activated National Guard or Reserve***	1.55	(1.26, 1.90)
National Guard or Reserve (not activated)***	0.71	(0.61, 0.82)
Rank (reference group: E-1–E-4)		
E-5–E-9**	0.85	(0.78, 0.93)
W-1–W-5	0.97	(0.61, 1.54)
O-1–O-3*	0.67	(0.47, 0.96)
O-4–O-6	1.01	(0.58, 1.76)
VA disability rating (reference group: 10–20 percent)		
0	0.83	(0.41, 1.68)
30–40***	1.57	(1.23, 1.99)
50–60***	1.75	(1.39, 2.20)
70–80***	2.24	(1.79, 2.80)
90–100***	3.29	(2.63, 4.13)
VA disability rating pending or on appeal***	2.15	(1.68, 2.76)
No VA disability rating	0.83	(0.64, 1.07)

Table B.11.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Type of service-related injury or health condition		
Amputation*	1.34	(0.58, 1.76)
Ankle or foot injury***	1.27	(1.17, 1.38)
Anxiety	0.98	(1.04, 1.74)
Back, neck, or shoulder problem***	1.60	(1.45, 1.77)
Blindness or severe vision loss	0.97	(0.73, 1.28)
Burn, severe	0.84	(0.65, 1.07)
Depression (self-reported)	1.02	(0.89, 1.17)
Fractured bone**	1.19	(1.07, 1.32)
Hand injury**	0.86	(0.78, 0.96)
Head injury other than TBI	0.92	(0.82, 1.03)
Hearing loss**	0.87	(0.80, 0.94)
Hip injury***	1.35	(1.20, 1.52)
Knee injury or problem***	1.36	(1.26, 1.48)
Migraine or other severe headache***	1.17	(1.07, 1.27)
Military sexual trauma	0.97	(0.80, 1.17)
Nerve injury***	1.76	(1.60, 1.92)
PTSD (self-reported)***	0.69	(0.62, 0.78)
Shrapnel problem**	0.79	(0.69, 0.91)
Sleep problem***	1.27	(1.14, 1.40)
Spinal-cord injury***	2.05	(1.82, 2.30)
TBI	0.92	(0.84, 1.01)
Tinnitus	1.06	(0.97, 1.16)
Other severe physical injury	1.07	(0.90, 1.27)
Other severe mental injury	0.88	(0.73, 1.06)
No physical or mental health injury or health problem ^a	0.90	(0.54, 1.52)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	2.45	(2.23, 2.68)
Any probable PTSD (positive screen)**	1.18	(1.06, 1.31)
Any probable problem drinking (positive screen)**	0.70	(0.65, 0.76)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,798$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Analyses for Chapter Three, Education and Employment Outcomes

Labor-Force Status

This appendix details a logistic regression analysis exploring Alumnus characteristics and labor-force status. Table C.1.1 lists variables used in the analysis.

Table C.1.2 provides the weighted odds ratios associated with each explanatory variable. The results show the following:

- Female Alumni are 1.4 times more likely than male Alumni to be out of the labor force.
- Hispanic or Latino and Native Hawaiian or Pacific Islander Alumni are 1.1 times more likely than white Alumni to be out of the labor force.
- Alumni between the ages of 51 and 55 and Alumni over the age of 55 are 1.6 and 1.7 times more likely, respectively, than 26- to 30-year-old Alumni to be out of the labor force.
- Previously married and never-married Alumni are 1.2 and 1.3 times more likely than married Alumni to be out of the labor force.
- Alumni who served in the Marine Corps are less likely than Army Alumni to be out of the labor force.
- Alumni who had ranks of E-5 to E-9 or O-1 to O-3 are less likely than E-1-to-E-4 Alumni to be out of the labor force.
- Alumni with VA disability ratings of 30 to 80 percent are more likely to be out of the labor force than Alumni with ratings of 10 to 20 percent. For example, Alumni with ratings of 30 to 40 percent are 1.4 times more likely, and Alumni with ratings of 90 to 100 percent are 8.2 times more likely. Those with no VA disability rating or with ratings pending or on appeal are less likely to be out of the labor force than Alumni with ratings of 10 to 20 percent.
- Alumni reporting the following service-related conditions are more likely to be out of the labor force than Alumni who did not report these conditions: amputation (1.3 times), anxiety (1.4 times), depression (1.3 times), military sexual trauma (1.3 times), spinal-cord injury (1.2 times), or TBI (1.2 times). Alumni who screened positive for any probable depression are 1.5 times more likely to be out of the labor force than Alumni who did not screen positive. Alumni who screened positive for any probable PTSD are 1.1 times more likely than Alumni who did not screen positive to be out of the labor force. Alumni reporting service-related ankle or foot injury or other severe mental injury are less likely to be out of the labor force than Alumni who did not report these conditions. Alumni who screened positive for any probable problem drinking are less likely to be out of the labor force than those who screen negative.

Table C.1.1
Variables Used in Logistic Regression of Labor-Force Status on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A. We did not include service-component variables as explanatory variables in the analysis given that being on active duty or activated National Guard or Reserve perfectly predicts employment.
Outcome variable	<p>Survey questions:</p> <p>"Are you currently employed in paid work, either full time or part time?"</p> <p>"During the <i>last four weeks</i>, did you actively look for work?"</p> <p>"Last week, could you have started a job if offered one, or returned to work if recalled?"</p> <p>Response coded as a 1 if respondent selected both "No" for the employment question and "No" for not looking for work in the past four weeks or if respondent selected "Yes" for looking for work and "No" for whether could have started job if offered for any reason other than temporary illness.</p> <p>Response coded as a 0 in all other conditions.</p>

Table C.1.2
Relationship Among Explanatory Variables and Being Out of the Labor Force

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female***	1.36	(1.18, 1.56)
Race or ethnicity (reference group: white)		
Black	0.87	(0.76, 1.00)
Hispanic or Latino*	1.10	(0.98, 1.24)
American Indian or Alaska Native	1.06	(0.77, 1.44)
Asian	0.85	(0.61, 1.18)
Native Hawaiian or other Pacific Islander*	1.10	(0.70, 1.73)
Other	1.13	(0.85, 1.49)
More than one race or ethnicity selected	0.97	(0.82, 1.14)
Age, in years (reference group: 26–30)		
18–25	1.13	(0.91, 1.40)
31–35	1.03	(0.92, 1.14)
36–40	1.10	(0.97, 1.25)
41–45	0.91	(0.79, 1.04)
46–50	1.09	(0.94, 1.27)
51–55***	1.57	(1.29, 1.91)
56+***	1.74	(1.35, 2.24)
Marital status (reference group: married)		
Never married**	1.26	(1.10, 1.43)
Previously married**	1.19	(1.08, 1.31)

Table C.1.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Branch of service (reference group: Army)		
Air Force	0.94	(0.80, 1.11)
Marine Corps**	0.72	(0.65, 0.81)
Navy or Coast Guard	0.96	(0.83, 1.11)
More than one branch of service	1.06	(0.91, 1.23)
Rank (reference group: E-1–E-4)		
E-5–E-9**	0.76	(0.69, 0.83)
W-1–W-5	0.62	(0.38, 1.01)
O-1–O-3**	0.45	(0.30, 0.67)
O-4–O-6	0.63	(0.38, 1.04)
VA disability rating (reference group: 10–20 percent)		
0	0.92	(0.43, 1.95)
30–40*	1.36	(1.02, 1.82)
50–60***	2.03	(1.54, 2.66)
70–80***	3.19	(2.45, 4.15)
90–100***	8.15	(6.25, 10.61)
VA disability rating pending or on appeal*	0.69	(0.51, 0.93)
No VA disability rating***	0.23	(0.16, 0.33)
Type of service-related injury or health condition		
Amputation*	1.33	(1.03, 1.70)
Ankle or foot injury**	0.86	(0.79, 0.94)
Anxiety**	1.40	(1.24, 1.58)
Back, neck, or shoulder problem	0.92	(0.82, 1.02)
Blindness or severe vision loss	1.10	(0.85, 1.42)
Burn, severe	0.84	(0.66, 1.06)
Depression (self-reported)**	1.29	(1.12, 1.50)
Fractured bone	1.08	(0.98, 1.21)
Hand injury	0.95	(0.85, 1.05)
Head injury other than TBI	1.09	(0.97, 1.21)
Hearing loss	0.94	(0.86, 1.03)
Hip injury	0.98	(0.87, 1.10)
Knee injury or problem	0.98	(0.90, 1.06)
Migraine or other severe headache	0.99	(0.90, 1.08)

Table C.1.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Military sexual trauma*	1.26	(1.05, 1.52)
Nerve injury	1.09	(1.00, 1.20)
PTSD (self-reported)	0.98	(0.86, 1.12)
Shrapnel problem	0.88	(0.77, 1.01)
Sleep problem	1.09	(0.97, 1.23)
Spinal-cord injury**	1.17	(1.05, 1.31)
TBI***	1.23	(1.13, 1.35)
Tinnitus	0.91	(0.83, 1.00)
Other severe physical injury	0.89	(0.74, 1.07)
Other severe mental injury*	0.80	(0.65, 0.98)
No physical or mental health injury or health problem ^a	0.83	(0.43, 1.59)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	1.54	(1.39, 1.70)
Any probable PTSD (positive screen)*	1.14	(1.12, 1.28)
Any probable problem drinking (positive screen)***	0.65	(0.60, 0.70)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,882$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Employment Status

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with employment. Table C.2.1 lists variables used in the analysis. We restricted the sample such that we excluded from the analysis Alumni who were NILF.

Table C.2.2 provides the weighted odds ratios associated with each explanatory variable. The results show the following among Alumni who are in the labor force:

- There are no gender differences in employment.
- Alumni who are black or who indicated that they are more than one race or ethnicity are less likely than white Alumni to be employed.
- Alumni who are 31 to 35 and 41 to 50 are 1.2 and 1.4 times more likely, respectively, than 26- to 30-year-old Alumni to be employed.
- Never-married and previously married WWP Alumni are less likely than married Alumni to be employed.
- WWP Alumni who were in the Navy or Coast Guard or more than one branch of service are less likely than Army Alumni to be employed.
- Alumni who had ranks of E-5 to E-9 are 1.3 times more likely to be employed than Alumni who had ranks of E-1 to E-4.
- Alumni with VA disability ratings of 50 percent or greater are less likely than those with 10- to 20-percent ratings to be employed. Alumni whose ratings are pending or on appeal are 1.6 times more likely to be employed. Alumni with no VA disability rating are 3.8 times more likely than Alumni with ratings of 10 to 20 percent to be employed.
- Alumni who reported having service-related depression or knee injury or problem are less likely to be employed than those without those conditions. Alumni who screened positive for any probable depression are less likely than those who did not screen positive to be employed. Alumni reporting service-related tinnitus are 1.2 times more likely than those who did not report the condition to be employed.

Table C.2.1
Variables Used in Logistic Regression of Employment Status on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A. We did not include service-component variables as explanatory variables in the analysis given that being on active duty or activated National Guard or Reserve perfectly predicts employment.
Outcome variable	Survey question: "Are you currently employed in paid work, either full time or part time?" Response coded as a 1 if respondent selected either "Yes, full time" or "Yes, part time." Response coded as a 0 if "No" is selected.

Table C.2.2
Relationship Among Explanatory Variables and Being Employed

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.05	(0.83, 1.32)
Race or ethnicity (reference group: white)		
Black***	0.62	(0.51, 0.76)
Hispanic or Latino	0.85	(0.70, 1.03)
American Indian or Alaska Native	1.25	(0.71, 2.20)
Asian	0.70	(0.47, 1.05)
Native Hawaiian or other Pacific Islander	0.99	(0.50, 1.93)
Other	0.65	(0.42, 1.02)
More than one race or ethnicity selected**	0.67	(0.53, 0.84)
Age, in years (reference group: 26–30)		
18–25	0.76	(0.67, 1.01)
31–35*	1.23	(1.05, 1.44)
36–40	1.11	(0.91, 1.34)
41–45*	1.25	(1.01, 1.54)
46–50**	1.42	(1.10, 1.82)
51–55	1.35	(0.96, 1.90)
56+	1.43	(0.87, 2.34)
Marital status (reference group: married)		
Never married***	0.62	(0.52, 0.75)
Previously married***	0.62	(0.54, 0.72)
Branch of service (reference group: Army)		
Air Force	1.25	(0.95, 1.65)
Marine Corps	1.08	(0.91, 1.29)

Table C.2.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Navy or Coast Guard*	0.80	(0.64, 0.99)
More than one branch of service*	0.76	(0.60, 0.96)
Rank (reference group: E-1–E-4)		
E-5–E-9**	1.23	(1.06, 1.42)
W-1–W-5	2.65	(0.79, 8.88)
O-1–O-3	1.08	(0.62, 1.87)
O-4–O-6	2.00	(0.76, 5.24)
VA disability rating (reference group: 10–20 percent)		
0	0.58	(0.26, 1.29)
30–40	0.92	(0.64, 1.34)
50–60*	0.64	(0.45, 0.91)
70–80**	0.63	(0.45, 0.89)
90–100***	0.46	(0.32, 0.65)
VA disability rating pending or on appeal*	1.59	(1.07, 2.35)
No VA disability rating***	3.76	(2.44, 5.78)
Type of service-related injury or health condition		
Amputation	1.29	(0.81, 2.05)
Ankle or foot injury	0.94	(0.82, 1.08)
Anxiety	0.96	(0.80, 1.15)
Back, neck, or shoulder problem	0.95	(0.80, 1.12)
Blindness or severe vision loss	1.00	(0.64, 1.55)
Burn, severe	0.89	(0.60, 1.31)
Depression (self-reported)*	0.79	(0.63, 0.99)
Fractured bone	0.98	(0.82, 1.16)
Hand injury	0.92	(0.77, 1.09)
Head injury other than TBI	0.89	(0.74, 1.06)
Hearing loss	0.9	(0.83, 1.10)
Hip injury	1.01	(0.84, 1.21)
Knee injury or problem***	0.77	(0.67, 0.88)
Migraine or other severe headache	1.00	(0.87, 1.14)
Military sexual trauma	0.75	(0.55, 1.02)
Nerve injury	0.99	(0.85, 1.16)
PTSD (self-reported)	1.13	(0.94, 1.36)

Table C.2.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Shrapnel problem	1.08	(0.86, 1.36)
Sleep problem	1.02	(0.87, 1.21)
Spinal-cord injury	0.88	(0.74, 1.05)
TBI	1.07	(0.92, 1.23)
Tinnitus*	1.17	(1.01, 1.35)
Other severe physical injury	1.26	(0.95, 1.69)
Other severe mental injury	1.13	(0.83, 1.53)
No physical or mental health injury or health problem ^a	1.49	(0.62, 3.60)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)***	0.70	(0.61, 0.81)
Any probable PTSD (positive screen)	0.90	(0.76, 1.06)
Any probable problem drinking (positive screen)	0.99	(0.87, 1.13)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Full time or part time, sample restricted to WWP Alumni in the labor force only. $n = 11,309$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Alumnus Characteristics and Use of the U.S. Department of Veterans Affairs Vocational Rehabilitation and Employment Program

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of use of the VA VR&E program. Table C.3.1 lists variables used in the analysis. To restrict our analysis to those respondents most likely to be eligible for VR&E, we conducted this analysis using only the subsample of respondents who had VA disability ratings of 10 percent or greater. We excluded from the analysis respondents with VA disability ratings of 0 percent, no VA disability rating, or whose rating was pending or on appeal.

Table C.3.2 provides the weighted odds ratios associated with each explanatory variable. The results show the following among Alumni with VA disability ratings of 10 or greater:

- There are no significant gender differences in VR&E benefit use.
- Alumni in the following racial and ethnic groups are more likely than white Alumni to use VR&E benefits: black (1.5 times), Hispanic or Latino (1.2 times), or who indicated that they are of another race or ethnicity than those in the list in the table (1.6 times).
- Alumni who are over the age of 40 are less likely than those ages 26 to 30 to use VR&E benefits.
- There are no significant differences based on marital status.
- There are no service-specific differences in VR&E use.
- Active-component and activated National Guard or Reserve Alumni are less likely than Alumni who are out of the military to use VR&E.
- There are no differences in VR&E use based on rank.
- Alumni with disability ratings of 30 percent or greater are more likely than Alumni with 10- to 20-percent ratings to use VR&E benefits. For example, Alumni with ratings of 30 to 40 percent are 2.2 times more likely, and Alumni with ratings of 50 to 60 percent are 2.9 times more likely.
- There are few differences in VR&E use based on injury type. Alumni reporting service-related TBI are 1.2 times more likely than those not reporting TBI to use VR&E benefits. Alumni who reported severe burns are less likely than those who did not report such burns to report using VR&E benefits. Alumni who screened positive for any probable problem drinking are less likely than those who did not screen positive to use VR&E benefits.

Table C.3.1
Variables Used in Logistic Regression of Vocational Rehabilitation and Employment Program Use on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "Which of the following VA or government benefits are you using to pursue your education?" Response coded as a 1 if the respondent selected "VA's Vocational Rehabilitation and Employment Program (VR&E)." Response coded as a 0 if not selected.

Table C.3.2
Relationship Among Explanatory Variables and Using the U.S. Department of Veterans Affairs Vocational Rehabilitation and Employment Program

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.04	(0.84, 1.28)
Race or ethnicity (reference group: white)		
Black***	1.51	(1.24, 1.83)
Hispanic or Latino*	1.22	(1.03, 1.45)
American Indian or Alaska Native	0.67	(0.38, 1.18)
Asian	1.17	(0.75, 1.83)
Native Hawaiian or other Pacific Islander	1.40	(0.74, 2.65)
Other*	1.55	(1.02, 2.36)
More than one race or ethnicity selected	1.16	(0.93, 1.44)
Age, in years (reference group: 26–30)		
18–25	0.98	(0.72, 1.34)
31–35	0.94	(0.81, 1.09)
36–40	0.88	(0.73, 1.06)
41–45**	0.76	(0.61, 0.93)
46–50***	0.64	(0.50, 0.82)
51–55***	0.38	(0.26, 0.55)
56+***	0.29	(0.16, 0.52)
Marital status (reference group: married)		
Never married	1.04	(0.86, 1.25)
Previously married	1.06	(0.92, 1.22)

Table C.3.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Branch of service (reference group: Army)		
Air Force	0.99	(0.77, 1.28)
Marine Corps	1.00	(0.85, 1.18)
Navy or Coast Guard	0.94	(0.76, 1.17)
More than one branch of service	1.11	(0.87, 1.41)
Service component (reference group: out of the military)		
Active component*	0.59	(0.38, 0.90)
Activated National Guard or Reserve**	0.36	(0.19, 0.67)
National Guard or Reserve (not activated)	0.74	(0.55, 1.01)
Rank (reference group: E-1–E-4)		
E-5–E-9	0.89	(0.79, 1.01)
W-1–W-5	0.24	(0.03, 1.82)
O-1–O-3	0.87	(0.43, 1.75)
O-4–O-6	1.32	(0.60, 2.87)
VA disability rating (reference group: 10–20 percent)		
0	—	—
30–40**	2.15	(1.38, 3.36)
50–60***	2.85	(1.86, 4.36)
70–80***	2.81	(1.84, 4.28)
90–100***	2.33	(1.52, 3.57)
VA disability rating pending or on appeal	—	—
No VA disability rating	—	—
Type of service-related injury or health condition		
Amputation	1.33	(0.93, 1.92)
Ankle or foot injury	1.01	(0.89, 1.14)
Anxiety	1.00	(0.84, 1.20)
Back, neck, or shoulder problem	0.97	(0.83, 1.15)
Blindness or severe vision loss	0.93	(0.61, 1.42)
Burn, severe*	0.65	(0.44, 0.97)
Depression (self-reported)	0.98	(0.78, 1.23)
Fractured bone	1.08	(0.93, 1.27)
Hand injury	1.00	(0.85, 1.17)
Head injury other than TBI	1.03	(0.87, 1.23)

Table C.3.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Hearing loss	0.94	(0.82, 1.07)
Hip injury	1.06	(0.90, 1.26)
Knee injury or problem	1.03	(0.90, 1.17)
Migraine or other severe headache*	0.85	(0.75, 0.97)
Military sexual trauma	1.20	(0.92, 1.56)
Nerve injury	1.13	(0.98, 1.29)
PTSD (self-reported)	0.84	(0.69, 1.02)
Shrapnel problem	0.91	(0.73, 1.13)
Sleep problem	1.06	(0.89, 1.26)
Spinal-cord injury	0.96	(0.81, 1.13)
TBI**	1.22	(1.06, 1.40)
Tinnitus	1.09	(0.95, 1.25)
Other severe physical injury	1.02	(0.77, 1.36)
Other severe mental injury	1.25	(0.92, 1.70)
No physical or mental health injury or health problem ^a	2.19	(0.92, 5.19)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)	0.96	(0.82, 1.11)
Any probable PTSD (positive screen)	0.96	(0.81, 1.15)
Any probable problem drinking (positive screen)**	0.82	(0.73, 0.93)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We conducted this analysis using only data from respondents reporting VA disability ratings of 10 percent or greater. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. Sample restricted to Alumni with VA disability ratings of 10 percent or greater. $n = 14,533$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

Use of Post-9/11 GI Bill Benefits

This appendix details a logistic regression analysis exploring Alumnus characteristics and their associations with Alumnus self-reports of use of Post-9/11 GI Bill benefits. Table C.4.1 lists variables used in the analysis. Because eligibility criteria for Post-9/11 GI Bill benefits are broad, we conducted this analysis on the full sample.

Table C.4.2 provides the weighted odds ratios associated with each explanatory variable. The results show the following:

- Male and female Alumni do not differ significantly in the likelihood of use of the Post-9/11 GI Bill.
- Alumni of the following racial and ethnic groups are more likely than white Alumni to use Post-9/11 GI Bill benefits: black (1.4 times), Hispanic or Latino (1.2 times), Asian (1.4 times), or those who indicate that they are more than one race or ethnicity (1.3 times).
- Alumni who are 18 to 25 are 1.3 times more likely than 26- to 30-year-old Alumni to use Post-9/11 GI Bill benefits. Alumni over the age of 30 are less likely than those ages 26 to 30 to use Post-9/11 GI Bill benefits.
- Alumni who have previously been married are 1.2 times more likely than currently married Alumni to use Post-9/11 GI Bill benefits.
- Navy or Coast Guard Alumni are 1.2 times more likely than Army Alumni to use Post-9/11 GI Bill benefits.
- Active-duty and activated National Guard or Reserve Alumni are less likely than those who are out of the military to use Post-9/11 GI Bill benefits.
- Alumni with a rank of E-5 to E-9 or O-1 to O-3 are 1.4 and 1.9 times more likely, respectively, than E-1-to-E-4 Alumni to use the Post-9/11 GI Bill.
- The most-severely disabled Alumni (i.e., those with ratings of 90 to 100 percent) are less likely to use Post-9/11 GI Bill benefits.
- There are few differences in Post-9/11 GI Bill benefit use based on injury type. Alumni reporting a knee injury or problem are 1.1 times more likely than those not reporting those problems to use the benefit. Alumni reporting amputation or TBI are less likely than those not reporting those conditions to use their Post-9/11 GI Bill benefits.

Table C.4.1
Variables Used in Logistic Regression of Use of the Post-9/11 GI Bill on Alumnus Characteristics

Variable Type	Variables Used
Explanatory variables included in analysis	All variables in Table A.3 in Appendix A
Outcome variable	Survey question: "Which of the following VA or government benefits are you using to pursue your education?" Response coded as a 1 if the respondent selected "Post-9/11 GI Bill or otherwise known as the New GI Bill." Response coded as a 0 if not selected.

Table C.4.2
Relationship Among Explanatory Variables and Using Post-9/11 GI Bill Benefits

Explanatory Variable	Odds Ratio	95% Confidence Interval
Gender (reference group: male)		
Female	1.12	(0.96, 1.30)
Race or ethnicity (reference group: white)		
Black***	1.42	(1.22, 1.65)
Hispanic or Latino**	1.24	(1.09, 1.41)
American Indian or Alaska Native	0.86	(0.58, 1.27)
Asian*	1.38	(1.03, 1.85)
Native Hawaiian or other Pacific Islander	0.80	(0.46, 1.38)
Other	0.94	(0.66, 1.34)
More than one race or ethnicity selected**	1.28	(1.09, 1.51)
Age, in years (reference group: 26–30)		
18–25**	1.33	(1.10, 1.60)
31–35***	0.57	(0.51, 0.63)
36–40***	0.45	(0.39, 0.51)
41–45***	0.35	(0.39, 0.41)
46–50***	0.25	(0.21, 0.30)
51–55***	0.21	(0.16, 0.27)
56+***	0.18	(0.12, 0.26)
Marital status (reference group: married)		
Never married	1.00	(0.88, 1.14)
Previously married**	1.20	(1.08, 1.33)
Branch of service (reference group: Army)		
Air Force	1.05	(0.88, 1.26)
Marine Corps	1.03	(0.91, 1.16)

Table C.4.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Navy or Coast Guard*	1.18	(1.01, 1.37)
More than one branch of service	0.89	(0.74, 1.08)
Service component (reference group: out of the military)		
Active component**	0.14	(0.10, 0.18)
Activated National Guard or Reserve**	0.43	(0.32, 0.58)
National Guard or Reserve (not activated)	0.96	(0.82, 1.13)
Rank (reference group: E-1–E-4)		
E-5–E-9***	1.43	(1.29, 1.58)
W-1–W-5	1.20	(0.56, 2.59)
O-1–O-3**	1.89	(1.20, 2.98)
O-4–O-6	1.06	(0.51, 2.19)
VA disability rating (reference group: 10–20 percent)		
0	1.50	(0.85, 2.65)
30–40	1.03	(0.80, 1.33)
50–60	1.12	(0.88, 1.43)
70–80	1.05	(0.82, 1.33)
90–100*	0.77	(0.60, 0.98)
VA disability rating pending or on appeal	1.00	(0.76, 1.32)
No VA disability rating	0.76	(0.56, 1.02)
Type of service-related injury or health condition		
Amputation*	0.66	(0.47, 0.92)
Ankle or foot injury	1.00	(0.91, 1.10)
Anxiety	1.04	(0.91, 1.19)
Back, neck, or shoulder problem	1.11	(0.99, 1.25)
Blindness or severe vision loss	0.83	(0.58, 1.20)
Burn, severe	0.93	(0.69, 1.26)
Depression (self-reported)	0.97	(0.83, 1.13)
Fractured bone	1.09	(0.97, 1.22)
Hand injury	1.04	(0.93, 1.18)
Head injury other than TBI	0.94	(0.82, 1.07)
Hearing loss	1.03	(0.93, 1.13)
Hip injury	0.99	(0.86, 1.13)
Knee injury or problem**	1.14	(1.03, 1.25)

Table C.4.2—Continued

Explanatory Variable	Odds Ratio	95% Confidence Interval
Migraine or other severe headache	0.99	(0.89, 1.09)
Military sexual trauma	1.08	(0.88, 1.33)
Nerve injury	0.96	(0.86, 1.06)
PTSD (self-reported)	0.91	(0.79, 1.04)
Shrapnel problem	0.95	(0.81, 1.13)
Sleep problem	0.97	(0.86, 1.10)
Spinal-cord injury	0.98	(0.86, 1.11)
TBI*	0.88	(0.79, 0.98)
Tinnitus	0.98	(0.88, 1.08)
Other severe physical injury	0.92	(0.76, 1.12)
Other severe mental injury	0.96	(0.78, 1.19)
No physical or mental health injury or health problem ^a	0.80	(0.41, 1.53)
Positive screen for mental health conditions (reference group: negative screen for each respective condition)		
Any probable depression (positive screen)	0.92	(0.82, 1.02)
Any probable PTSD (positive screen)	1.07	(0.94, 1.21)
Any probable problem drinking (positive screen)	1.01	(0.93, 1.10)

NOTE: All data used in this analysis are from WWP, 2014, and we weighted percentages to represent the full WWP Alumnus population. For more on the survey and weights, see Franklin et al., 2014. We entered all explanatory variables into the analysis simultaneously. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$. $n = 17,849$.

^a This group is small and is not representative of service members and veterans who do not experience service-related health conditions.

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